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# NORTHERN ALASKA IN WINTER.

BY

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The low coastal plain of Northern Alaska gradually edges northward as it makes it way west from the International Boundary to Point Barrow, and then as gradually gives way southward as it continues towards Behring Straits, while the mountains make a short cut from the Mackenzie delta to intercept the coast line at Cape Lisburne—or, to change the figure, the mountains are an 800 mile bowstring to a thousand mile bow of seacoast.

The triangle of land north of these mountains is, in general, low and flat, though slightly rolling in places—typical arctic tundra, covered with grass and moss, rough with "nigger heads,"* and flecked with ponds and lakes of various sizes and shapes. These lakes, though they cover in the aggregate perhaps not more than a sixth of the entire country, are so situated usually as to make summer travel well-nigh impossible—one is fortunate if three miles of walking take him a single mile in the desired direction. If they have to travel in summer the Eskimos are confined to certain river and portage routes used by their ancestors "from always."

The coastal plain is drained by a large number of rivers, some of them badly charted and others absent from our most recent maps. To a stranger who attempts to follow even the best maps they are worse than useless, for one is likely to strand even a small boat upon the delta flats of a large river where the chart indicates

* "Nigger heads" are small hillocks with cracks and crevices between them—mounds of the size of molehills but shaped more like mushrooms.



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an unbroken coast line (as the writer has himself been unfortunate enough to do), while one looks for rivers where none exists, and hopes for shelter from storms behind capes that are imaginary. When a river has once been found, however, the fact that it comes to the coast from another direction than that which the chart indicates, is of little consequence to one who wants to ascend it for hunting or kindred purposes. It is in trying to cross over from one stream to another that danger would arise, but fortunately one cannot get far enough inland for that without ceasing to rely on a chart that is correct hardly oftener than the "law of chances" prescribes.

At Herchel Island the mountains are only some five or eight miles from the coast; at Flaxman Island, some 160 miles west of Herchel, they are, perhaps, thirty miles away; fifty miles west of Flaxman they are no longer in sight from the ocean. Anywhere east of the Colville river the rise of the land from sea level inland is perceptible to the eye; west of the Colville it is not, and at Smith Bay or Point Barrow one might travel inland for days under the impression that one walked on land not thirty feet above sea level. The rivers, however, show clearly enough that this is not the case, for fifty miles inland some of them have banks from fifty to a hundred feet high, and, nevertheless, flow seaward with a good steady current.

The rivers are usually devoid of tree growth near the sea, though one of the largest of them, the Mayoriak (in Smith Bay), has dwarf arctic willow growing to within four miles of the sea. The willow is crooked, grows not over five feet in height, though it would be much longer if the crooks and kinks were straightened out of it, and is seldom over an inch in diameter a foot above the ground. On the Colville delta islands, willow of a somewhat larger size grows north beyond the limit of tidewater. But salt water, with a westerly storm, comes far up the Colville—sometimes even up into the Itkillik, a branch that enters about two days' sled journey from the sea (perhaps 40 miles)—this with a rise of tide on coast of not over four feet.

Almost all the rivers have, somewhere in their course, willow large enough and abundant enough for fuel and building materials for considerable communities of Eskimos, or communities that were considerable till civilization and the diseases and well-meant and pious cruelty of the white civilizers depopulated them. By willow "big enough for house-building" the inland Eskimo means sticks an inch and a half to three inches in diameter at the lower end and seven to twelve feet in length. These serve him as a basket-like

frame to support a house of moss and turf, a comfortable and healthful dwelling in all weather. Those of the rivers that have a swift current (e. g., the Kugruak, Shaviōvik, Shagavanaktok, Kupáruk) have drift willow scattered along their course to the sea in sufficient abundance so that the winter traveller who knows where to look under the snow for fuel can dig up enough dry sticks for the camp stove.

Fuel is abundant all along the coast from Herschel Island to within thirty miles east of Point Barrow. On the sandspits and bars that form the last thirty miles, fuel was formerly abundant, and since the people of the two large villages of Point Barrow and Cape Smythe (total population from 500 to 600 at different seasons) commenced living in wastefully cold and murderously damp white men's houses the entire enormous mass of accumulated driftwood has been consumed in a vain attempt to keep warm through the arctic night, dwellings built according to the ideas of missionaries and school teachers from the Mississippi Valley and the Middle Atlantic States. It may show forgetfulness of scientific dignity to suggest that the patrons of missions and the powers of the Department of Education in New York and Washington should ask their representatives to send them not only photographs of the "tidy modern" frame cockleshell of houses that are taking the place of the old Eskimo "hovels" at Barrow, Alaska, but also as companion pictures a few views of the graveyard behind the village where lie the victims of pneumonia, tuberculosis and other diseases that are bred in damp and cold. The village of Barrow (Cape Smythe) has about the same population now as it had twenty years ago, but not more than one man in twenty is a native of the place. Good wages at the whaling station and the bounty of the government school and the local mission keep a steady stream of immigrants moving across the little hill where the village stands to the little hollow behind where the graveyard lies. It seems to me that were I a lawmaker, powerless to keep out the influence of the "civilizer" from northern Alaska, I could get some satisfaction out of urging a law that should compel every "benevolent" organization that spends money up here to devote a certain share of its funds to the erection of marble slabs commemorating their victims. When the Eskimo have become a memory their monuments might serve to remind generations of greater understanding that there are few things more cruel than kindness, when that kindness is ignorant.

Formerly, driftwood was abundant along the entire north coast

of Alaska, but now very little comes ashore anywhere west and south from Point Barrow. This, if proof were needed, would show pretty conclusively that this section of the coast depends for its driftwood on the Yukon River; for the same years that have deprived that river of much of the trees along its immediate banks have deprived the northwest coast of wood for fuel, while the coast east of Barrow shows no marked diminution in its supply of driftwood. This would be the case if the eastern section of the coast got its wood from the Mackenzie, for the changes along that river are confined to its upper branches (the Peace and the Athabasca), and the Arctic driftwood of the Mackenzie comes largely from the Liard—for at least 99% of the driftwood of the Mackenzie's other two branches is stranded in Slave Lake.

The huge cottonwood trees scattered along the coast east of Barrow are of a character which the writer has not seen upon the Yukon (though such trees may of course exist there), but which he has seen on the Liard and Mackenzie. They, therefore, furnish a proof of westward currents (at least at certain seasons) along the north coast as far west as Barrow, while their absence beyond that point (and the driftwood dearth that coincides with the settlement of the Yukon valley) shows pretty well that this current does not follow the coast as it bends southward beyond the northwest corner of the continent. Taken together with the phenomenon, well known to whalers, that when ice moves past Cape Smythe it is generally in a northerly direction to and past Barrow, this makes pretty clear the fact that under average conditions there is an inverted "Y" (λ) formed by one current going northeast and another going northwest that meet at Barrow and join in a northward sweep approximately directed (on the start, at least) towards the pole.

A few years ago the disappearance of driftwood from the coast west of Barrow would have worked no considerable hardship, for until recently the oil of the seal, walrus, and whale was the fuel used. The native house has walls so thick and impervious to cold that four or five oil lamps kept it day and night at a uniform temperature of 65° to 85° F., and that with a ventilating chimney 2½ to 4 inches in diameter constantly open. When the house temperature is over +75° and the outside air is somewhere near below −40° the difference in the density of the outside and inside air is such that there is a current of the velocity of a force-blast through the ventilator continually. The more recent "civilized" dwelling, which the Eskimos are taking up, is so flimsy that even were it air-tight (as

it often is, very nearly) the oil lamps, though they be doubled in number, fail to keep it warm. A stove must be used and a roaring fire kept up. Then, at night, when people go to sleep, the fire dies out, everything in the house freezes, hoar frost forms on the ceiling and ice in the corners, in spite of the fact that the window-frames are puttied and even the keyhole in the door is plugged up. The "civilized" house has done away with ventilation and swept the beaches clean of wood. The wealthy Eskimo now imports coal from Seattle and elsewhere, the poor Eskimo goes 30 or 40 miles with his dogsled for fuel, and neither is so comfortably or healthfully lodged as he was ten years ago.

One might think that a little reasoning with them would show the folly of all this; but do the arguments of physicians lessen materially the sale of corsets in our department stores? While the whaler lives among them in his substantial whaling-station, and the missionary and school teacher dwell there, comfortably supported by wealthy maiden ladies and a benevolent government, so long will the Eskimos keep living in cheap imitations of white men's houses and dying before their time of pulmonary diseases.

Along certain sections of the coast the fuel problem is made less serious by the presence of surface coal of fair quality. One of these coal mines is located on Wainwright Inlet* (both sub-bituminous and lignite), and the people for some 20 or 30 miles each way from this point can get sufficient fuel with comparative ease. Coal outcrops at various other places, and on some sections of the beach it is piled up in quantities by ice and water action. Apparently the ice that is shoved in by southwest gales plows up the coal from the sea bottom. Coal can be got with little labour, therefore, in many places, but the only mines that are regularly worked (besides that at Wainwright) are near Cape Lisburn.

The climate of northern Alaska is, of course, typically arctic, but there is a marked difference (more especially in summer) between that of the coast section and places even no more than thirty or forty miles inland. Summer on the coast has few cloudless days, rain and mist are frequent and the temperature seldom rises to + 6° F.; in the interior rain and mist are rare and the sun shines almost continually, while days uncomfortably warm (to a white man) are by no means rare. In winter there is also a somewhat less amount of precipitation than on the coast and the proportion of clear days is greater, but the thermometer, on the other hand,

* The Wainwright coal mine was set on fire three or four years ago and is still burning. It is probable that this fire will soon consume all the coal that is readily accessible from the surface.

falls somewhat lower, even on the lowland, while in the mountains there is occasionally a difference of some 15° from the seashore temperature.* The most marked difference between the coast and interior in winter is in the matter of blizzards, which the Eskimos consider to be twice as frequent on the coast as they are inland. The Eskimos also consider the coast colder than the interior, and point to the fact that in the inland districts dogs never freeze to death unless they are starving, while on the coast even fat dogs sometimes freeze to death.

A few years ago the Eskimos of northern Alaska might have been broadly classified as Inlanders and Coast People, but now most of the inlanders have moved to the coast—starved from the inland by the disappearance of the caribou and attracted to the coast by trading opportunities, missionary bounty and abundance of food in the sea. The present distribution of the people is about as follows. The facts are given as ascertained in October, November, and December, 1908, and January, 1909:

From the International Boundary to Barter Island—none.

Inland on the rivers that enter the sea near Barter Island, eleven or twelve families (40 or 42 people).

On the Kugruak River (called "Kugura" on some maps, "Kugaru" on others), inland, one family (6 people).

At Flaxman Island, three families (10 people).

On the Shavióvik River, three families (about 12 people).

On the Shagavanaktok, three families (about 14 people).

On sandbars near the mouth of the Shagavanatok, two families (8 or 9 people).

On the Colville† River are several groups:

(a) Near Itkillikpak (the entrance of the Itkillik into the Colville), eight houses (45 people).

(b) Up the Itkillip River, six or seven families (about 25 people).

(c) Up the Kupik branch of the Colville, nine or ten families (about 40 people).

In the bottom of Smith Bay, two families (8 people).

On the Ikpikpûk River (so far as I know), three families (about 10 people).

At Point Barrow, about 100. This number, as that at Cape Smythe, varies with the season, according as people go out to hunt or come in to whale.

At Cape Smythe sometimes over 400 people.

At Sinagaru, 6; at the Kiktolik Reindeer Herd, 10; at Kiliviktaviagaru, 2; at Nadlek (Pearl Bay), 7; at Pingashugaru (Point Franklin), 20; at Tidzravik (Point Belcher), 6; at the Agavak deer herd, 14; at Oroónek (Wainwright Village, two miles north of Wainwright Inlet), 26; at Midliktaavik, 5; at Kaiyeksegavik (Icy Cape), about 95.

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*The lowest sea level temperature known to the wrter is—54° F. This is the minimum record of the Canadian Government weather station at Herschel Island. An instrument corrected by the same standard has shown —55° on Lake Winnipeg, Manitoba. Reliable thermometers have shown —79° F. at Macpherson on the Peel, 200 miles from Herschel Island.

†The Colville, as a whole, has no Eskimo name, though each of its branches has its own name as well as each of its more important mouths.

This gives us a total population for the Arctic coastal plain and the north slopes of the mountains of less than 1,000 individuals from the Canadian boundary on the east to Icy Cape on the west. As indicated above, the greater part of these people, although they now live on the coast, are in reality inlanders or else young people born on the coast of inlander parentage. Nevertheless the total population of this coast is undoubtedly less than it was twenty years ago—even in spite of the inlanders flocking to the sea. Mr. Brower, the owner of the whaling station at Cape Smythe, who came to Point Hope in 1884, and has resided at Cape Smythe since 1886, gives it as his opinion that there are not half as many people resident on the coast now as there were in 1889 or at any known earlier time—a third is nearer the actual. And for every twenty real coast dwellers (by ancestry) of that time not more than one exists now. The rest, with their descendants, are dead, most of them of measles, pneumonia and consumption.

As mentioned above, the caribou have in the last few years become very scarce in northern Alaska. In 1897, when several whaling ships were caught in the ice at or near Point Barrow, it was a mistaken concern on the part of our Government that sent a herd of reindeer "to the rescue of the starving whalers." Caribou meat was so abundant that year that although the ships' dogs ate meat to surfeit, over 400 (some say 500) caribou carcasses rotted the following summer, even after the ships had provisioned themselves for the coming summer out of the surplus caribou killed.

This fall, less than fifty deer were killed by the 500 odd inhabitants of Point Barrow and Cape Smythe, while between the Colville River and Barter Island, about 125 miles of coast, 24 were killed, including those secured by our own party. Fish in the rivers and fish and seal in the sea have become the dependence of even the inlanders who formerly were caribou eaters. It has been the same story here with the caribou as it was formerly on the plains with the buffalo—wanton killing by whites and natives alike. The whalers at Herschel Island one winter bought 40,000 pounds of caribou meat, and they bought hams only. No account was taken of meat eaten by the dog teams in the process of hauling to the ships (seven to twelve dogs to the team, the round trip sometimes taking twenty days). These dogs were also fed chiefly on hams. At Barrow, deer were frequently killed without even the traditional cutting out of the tongue, familiar to us in tales of buffalo slaughter.

After something over twenty years of wastefulness, made possible

by the use of modern rifles (the Eskimo have the best "high-power" ones) and abetted by the whalemen's purchase of meat and skins, the Eskimo is now dependant on the sea and the rivers for his food, and at his wit's end to secure suitable winter clothing. Those who still live inland depend chiefly on river fish, though they get a few sheep in the mountains. In the whaling localities they now and then get a cowhead, which furnishes a large amount of food, if weather conditions allow the cutting in of the meat; the head bone of a large animal has a market value of several thousand dollars, and this goes to buy coal and other articles which they have in recent years learned to need. The people, naturally, crowd most to places where a living is most easily made; the foregoing description of their present geographic distribution, therefore, shows approximately what localities the Eskimo at present considers most favorable.

As to the degree of the Eskimos present "civilization": A few of them wear "white men's clothes" at seasons when the weather permits it; they live in "white men's houses" when they can; they burn kerosene instead of seal or whale oil when they can; they eat "flour" and neglect their sealing while the flour lasts; most of them are Christianized to the extent of neither working nor traveling on Sunday, and of saying prayers on all possible occasions—such as before and after washing the face and hands, and before taking medicine (patent medicine, usually; perhaps the precaution is not wholly unnecessary). That the washing, which takes place frequently, and on all possible pretexts, is less for hygienic or æsthetic purposes than for ceremonial ones is shown pretty conclusively by the fact that an entire household often washes in one basinful of water—I have seen twenty-six people wash in about a pint of water; each one rubbed on soap profusely. That their prayers, though ever so Christian in wording, are to the people merely a new and more efficient kind of charm, is shown by the fact that a prayer useful for securing good luck in fishing is usually considered worthless for ducks, deer or anything else, even when the word "ducks" or "deer" has been substituted for the word "fish." Many of the most efficient prayers used on the north coast in hunting, curing sickness, etc., originate in Kotzebue Sound, are brought over the mountains into the upper Colville and spread from there east and west. A man who announces that he has brought over from Kotzebue a new and improved prayer for deer, immediately becomes a power among the Colville people.

Eskimos are naturally keen traders, but they differ somewhat

from white men in that the trading seems to be more of a game than a serious pursuit. Among the Colville people there does not seem to be nearly so much store set by getting a large amount of goods from the Point Barrow traders (Eskimos) who visit them every summer as in making spectacular trades for single skins or in getting more for an article than does one's neighbor. What the prices are may be seen pretty clearly from one example. A man who had ten deer skins to sell (some good, some poor) got the following list of goods for them. The goods had been purchased at Point Barrow, either from resident white traders or from whaling ships, and were articles of good quality. The trade was made in July, 1908, at the trading village of Nirg-lik, Colville delta:

Six sacks (300 lbs.) flour, two new Winchester rifles, 3,000 rounds of factory loaded cartridges for these rifles, smokeless powder, two complete sets of reloading tools, 3000 primers, 150 lbs. bar lead, 20 lbs. rifle powder, one case tea (40 or 60 lbs.), 50 lbs. granulated sugar, six lbs. baking powder, ten steel traps (fox traps), two bolts of six-ounce tent drilling (each 125 yards), one bolt cotton print (cheap quality), and various odds and ends—tea kettles, needles, thread, nails, rope, an ax, hammer, handsaw—in fact, pretty nearly a boat-load of goods that must have cost at Point Barrow a good deal more than they would in Seattle, or even in Nome. And even after spending a whole summer on the trading journey and paying such prices as this for skins, the Barrow traders seemed pretty well pleased if they could only hear of some rival who had got fewer skins for his boatload than they had.

The influence of the whites upon the people has made many changes in many things, but in few things has the change been for the better. My own judgment is that as you follow the coast of Alaska, from Canada west, you pass continually to communities of successively higher "civilization" and lower type in most of the things that really signify—in bodily health, morals, truthfulness, honesty, self-reliance, self-respect. This is also the opinion of all those white men (with one exception), with whom I have talked, and whose experience and knowledge of the country entitle them to an opinion. It might be suggested, in reply to this statement, that perhaps the people to the eastward were always of a superior type; but this objection is cancelled by two things: First, that the old men in each community are considered more honorable and dependable (many of them to a degree rare in white men) than the young, or those of middle age; second, that there is no dissent

among men who have been here ten or more years, from the opinion that these old men are typical of their generation, and that the tendency of the younger is steadily downward. This opinion seems to me to be so well grounded that it would be but flippancy to suggest that this admiration of the departed generation is caused mostly by the glamour that usually surround the "good old days," "the Golden Age."

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## CHARACTERISTICS OF AMERICAN RAILWAY TRAFFIC: A STUDY IN TRANSPORTATION GEOGRAPHY.

BY

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The freight traffic of American railways far exceeds the tonnage handled by the railroads in any other country; indeed, the demand for transportation has been so great and the needs have been so fully met in the United States that the line mileage of our railways is greater by fifteen per cent. than the mileage of all Europe and comprises two-fifths of the railway net of the entire world. The density of traffic, naturally, varies with different sections of the country, and travel and tonnage are light in the sparsely settled sections; but the economic activity is such that the railways in the United States are burdened with nearly twice as many tons as are shipped in Great Britain, with double the tonnage dispatched in Germany, and with five or six times the weight of cargo shipped in France.

This comparison, favourable as it is, does not do full justice to American railways, because it does not take into account the relative distances freight moves in the four countries. The areas of primary production are so widely separated from the manufacturing centers in the United States, the farm and the factories are so far removed from the large markets in and through which goods reach consumers, that freight must be carried long distances. Two hundred and forty miles is the average length of haul for a ton of freight in the United States, while in the compact countries of Great Britain, France and Germany the average distance travelled by a ton of freight is less than one-third that number of miles.

The unit to be used in comparing the total freight services of one railway system with those of another, or of the railroads of different countries, is the freight ton-mile—one ton of freight moved one mile. The freight ton-mileage, the tons shipped multiplied by the number

of miles carried—236,600,000,000 ton miles in 1907—was roundly nine times that of the German railways and twenty times the figures for France. The ton-mileage of the traffic on the British railways is not known, but it is apparently about one-sixth that of the American railroads.

Figures, such as the foregoing, as to total length of line and aggregate ton-mileage, give but partial information either regarding the kind of railroad systems in use in the United States and other countries, or concerning the traffic services performed by the railways. The line may have from one to four tracks; the roadbed structures and equipment may be of various degrees of efficiency. A "mile of railroad" is an indefinite term that means little until it has been described. Likewise, figures for ton-mileage measure dissimilar services when applied to the rail traffic in different countries or to the traffic of particular railroads within a country of continental proportions, such as the United States possesses.

The services of American railways—the volume and nature of their traffic—are determined by two classes of factors: those affecting both freight and passenger transportation in general, and those special factors that apply to only one of the two branches of the railroad business. To understand American railway traffic and the rates and fares charged therefor, and to make accurate comparisons either between railroads in different sections of the United States or between the lines in our country and abroad, these general and special factors must be kept in mind and given due weight.

The size, topography, and climate of the United States impose controlling conditions upon transportation. The railroad system adapted to the needs of a small insular country such as Great Britain or Japan or to the territory of a small portion of Europe, such as France or even Germany, will necessarily be unlike the system required in the United States, having absolute freedom of trade and traffic movement over an area equal to that of all Europe. If traffic be carried tens or hundreds of miles, as in most parts of Europe, it will be handled in relatively small units with an equipment adapted thereto; but, if the distances to be covered are hundreds or thousands of miles, as is true of passenger travel and of the shipments of foods, materials and manufactures within, out of or into the United States, economy requires that each car, train and locomotive shall move a relatively large number of passengers or of tons of freight. The mere size of the United States in part explains some of the obvious differences between the traffic methods of European and American railroads.

Topography is a physical factor hardly less influential than distance. The fact that the territory within the United States includes two relatively narrow seaboard areas separated by the Appalachian and Cordilleran ranges from the broad valley drained by the Mississippi River and its tributaries and composed of prairies and gently rolling lands has, from the beginning of railroad transportation in this country, strongly influenced the character of construction, the kind of equipment used and the methods of handling traffic. The effects of topography have been especially great, because the mountain uplifts lie athwart the routes of heaviest traffic, which in the United States run east and west connecting our populous and manufacturing Eastern States with the Mississippi Valley, from whose rich stores of mineral wealth and from whose fertile farms a return tide of traffic streams eastward over the Alleghanies to the mills and markets of both Atlantic America and of Europe, while the same great central basin of our country carries on a growing volume of commerce that moves westward and eastward to and from our great West and the far Orient. The majority of the great trunk lines of American railroads follow the parallels of latitude, in spite of the fortunate fact that the rapid progress of the southern and southwestern sections of the country is steadily swelling the volume of north and south traffic and increasing the importance of the roads that run with the lines of longitude and do not have mountains to overcome. In general, it has been and still is true that in the United States the railroads must carry traffic long distances, and must haul a relatively large share of their tonnage over mountain grades.

In Europe, the relation of traffic currents to topography, though somewhat complex, is, broadly speaking, the opposite of the relation in the United States; because the Alps have a general east and west trend. The great plain of Europe lies north of this continental divide, and extends, with broadening area, eastward from the great seaports and industrial centers of western Europe into which the major traffic routes converge. The countries about the Mediterranean constitute another important, though secondary, traffic area. Fortunately for Europe only a comparatively small volume of heavy freight need be shipped by rail between the northern and southern traffic districts. The trans-Alpine railroads handle mainly passengers, mail, express and light freight.

The climatic conditions prevailing in a country and in different sections of a country, as the result of topography and other geographic factors, establish a third physical control over the location and the traffic of railroads. It is climate, particularly rainfall, that

sets the sharpest limits to production and population. The only resources of arid lands are their minerals and they can be made available only to the extent that a mining population can be provided from other sections with food and water.

The United States has been so generously supplied with water resources that the entire three-fifths of the country lying east of the Rocky Mountains, with the exception of a part of the strip between the mountains and the 100th meridian, is productive and everywhere habitable. In the Pacific Coast States, the rains reach to the Sierra Nevada and Cascade mountains, upon whose spacious roof heavy winter snows linger late into the spring to nourish the streams during the summer months, that their waters may furnish power the year around and serve for irrigation when crops are growing. Over most of the broad Cordilleran highland the rainfall is so light that only limited areas can be successfully farmed. Irrigation is adding small, though highly productive, areas to tillage; but the climate is such that the mines, which are many and rich, and the ranches, which in the northern half of the Cordilleran region are numerous and broad, furnish the population with its chief industrial supports. Agriculture and general manufactures can never become extensive in the western plateau.

The United States, indeed, has a wide range of climate. The East, the South, the central West, the mountain section and the Pacific slope—each section has its own climate and its consequent industries. Each has its special transportation needs that have caused the characteristics of the traffic services of American railroads to vary with different parts of the country.

Another general determinant of the character of railroad traffic, both freight and passenger, is the stage the country has reached in economic and social development,—its state of civilization. The higher the degree of civilization the greater the demand for transportation. The working of this law is particularly noticeable in the passenger travel, the number of trips per person being highest in such countries as Great Britain, Belgium, Switzerland, Germany, France and the United States, whose inhabitants travel for social and cultural as well as economic reasons. It hardly need be said that cultural conditions are only one factor affecting the volume of travel and that the countries just named do not necessarily rank as above listed in the degree of their civilization, although they are cited in the order of average per capita trips per annum.

Most persons travel for business reasons, and business conditions mainly determine the amount of travelling done, but in all countries

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there is an increasing volume of travel for education, recreation, and other non-economic motives. In the smaller countries of Europe, where distances are short and the cultural inducements to travel are strong, cheap railway transportation has caused a rapidly rising percentage of the population to gratify their travel longings. In the United States, as a whole, the effect of cultural influences upon passenger traffic, while prominent, has been less marked than in several other countries, both because our long distances are a powerful deterrent to travel and for the reason that our land, though rich in scenic beauty, is still too young to abound in historic shrines and monuments of art.

That freight tonnage, as well as passenger travel, is greater *per capita* the higher the stage of civilization, and rises with the social and industrial progress of every country is a general law well illustrated by traffic conditions in eastern and southeastern Europe, as contrasted with those prevailing in western Europe, where civilization has reached a higher stage. This law expresses a fundamental and significant fact. Civilization results from the growth of human wants, which not only increase but become more complex as civilization advances. New industries arise to satisfy the enlarging demands of the individual and society, the processes of manufacture are subdivided, there is a greater territorial subdivision in production, and from all this results an increase in freight traffic far exceeding the rate of growth in population. Thus among the general conditions affecting the volume and character of the present and future freight traffic of American railroads is the degree of civilization now attained in this country and the rate at which it is advancing. Such an influence as this is manifestly not a factor whose effect can be definitely measured, but a knowledge of its presence may help to explain the distinctive features of the freight traffic of our railroads.

In contrast with these general factors, physical and social, affecting the characteristics of both the freight and passenger services, are certain special factors influencing the freight traffic and others that apply to passenger transportation.

The volume and nature of the freight handled by the railroads of any country or section of a country is determined primarily by the industries. Transportation is the servant of industry. The character of the country's products, whether they be of agriculture, of mines, or of forests, the location of the centers of manufacturing, whether they be close to or remote from the sources of materials and the markets and centers of distribution, the extent to which the

leading industries have been developed; these and all the many conditions determining what kinds of business shall be carried on and influencing their extent and territorial distribution decide what freight services the railroads shall perform.

A study of the sources of freight traffic in the United States, which will be made in the following paper,* will reveal the nature of American industries in some detail and indicate the nature of the rail transportation services they require. Here it need only be said, in passing, that nowhere else in the world do the industries require the handling of heavy materials as long distances as they are transported in the United States; and yet, despite this fact, there is an exceptionally high degree of integration of industry and of territorial specialization in production. In other words, the American railways have fully met the conditions imposed upon them by the industries they serve.

The extent to which inland and coastal waterways are used must influence the volume and kind of freight carried by the railroads. For Japan and the United Kingdom the surrounding ocean provides a cheap highway that can be readily taken by much traffic that must move by rail in most countries. In Germany, the ton-mileage of the traffic carried on the rivers and canals equals one-third the ton-mileage of the rail freight; and in France the ratio of water-borne traffic to the rail ton-mileage is even higher. The more waterways are used the lower will be the percentage which minerals and other bulky commodities comprise of the total traffic of the railroads. In the United States, minerals account for an exceptionally large share—53 per cent.—of the total rail tonnage, partly because, with the exception of the Great Lakes, the Ohio River, and a portion of the North Atlantic seaboard, the waterways are little used for transporting the products of our mines. Should the United States improve and extend its inland waterways, as is expected will be done, the traffic of our railroads will consist more largely of the classified or higher grade freight and relatively less of "commodity" or bulk traffic.

Another special factor, which has had much influence upon the freight traffic services desired of railroads, is the business habits of the people. The inhabitants of different countries and, to some extent, the residents of separated parts of the same country, have various ways of conducting their affairs. The Japanese, the Dutch, the English, the Americans, each have their accustomed business methods as farmers, merchants and manufacturers; and the rail-

* This paper will be printed in a later number of the *Bulletin*.

roads must do the work of transportation in conformity with the requirements of industy as carried on in each country; just as the railways in the United States must serve the Yankee farmer and trader, the Southern planter, the Western ranchman, and the lumberman of the Northwest. In spite of all that has been done to standardize railway methods in this country, the wide diversity in our industries and in our ways of doing things produces numerous variants in railway practice. Services conform in general to differences in business needs.

Of the special factors affecting the volume of passenger traffic of railways, sparseness or density of population is the most controlling. An agricultural section or a region rich in bulky minerals, although containing but a small population, may furnish a large freight tonnage, but travel will be light. As population increases passenger traffic expands, and at a more than proportional rate. In closely settled sections, the trips *per capita* are greater than in regions having fewer persons to the square mile. Various reasons account for this. The number of trips taken would, other things being equal, naturally be in inverse ratio to the difficulties to be overcome. Long distances deter people from travel; long journeys are expensive, time-consuming and wearisome. Short distances from city to city, or from city to mountains or seashore, are a lure to travel; fares are cheap and the trip is a pleasure. Men do business by making a personal call instead of by mail; and they relieve the monotony or lighten the drudgery of life by more frequent week-end or holiday trips. The fact that England and Belgium outrank the United States in the average number of journeys taken per inhabitant is easily accounted for by the density of the population living within their small areas.

In spite of the limitations which long distances place upon the number of trips taken, the average distance travelled by the American is exceeded only, and that slightly, by the average for the people of Great Britain. This is doubtless due in part to the relatively high average income of the people of the United States, a fact that has had much influence upon the policy followed by American railway companies in developing their passenger services. While European railways have sought to get the masses to travel by offering them, for low fares, third-class accommodations without luxuries, and a fourth class with few comforts and little speed, the American railway policy has been to continue to offer only the "first class" to the rank and file, and the railroads have striven to increase travel rather by making the services more attractive than by making them

cheap. The European roads have found a large demand for the cheaper, though inferior grades of service, nine-tenths of the travel being in classes below the second.

The subdivision of passenger traffic in Europe into several grades is frequently said to be the result of social stratification and the existence of class feeling; whereas, it is contended that Americans are more democratic in their feelings and are not influenced by class distinctions. Possibly this may be a partial explanation of the difference between the policies of European and American railroads as to the classification of traffic, but it is probable that the low average income of the industrial classes in Europe has been the chief reason for the development of the third- and fourth-class passenger services. The cause has been more economic than social. In the United States, moreover, it seems that the traditional policy is gradually changing with the steady growth of "Pullman" services, and of the patronage of extra-fare trains whereby passenger traffic is coming more and more to consist of two classes: one provided by the "first" class day coach patronized by those who desire to travel cheaply, and the other provided by the "parlor" coaches and extra-fare trains used by those who place comfort and speed above economy. It remains to be seen whether the demand for cheap transportation in America will cause our railroads to break up the present "first" class into two grades, and thus virtually introduce the European third-class service. The ultimate adoption of such a policy does not seem improbable.

Among the many minor factors that account for the volume of travel in any country is the strength of the desire of the people for outdoor life. Some people, though they live mainly in the cities, are content to pass most of their leisure as well as their working hours indoors, while to others the appeal of the outdoor world is irresistible. The Germans, for instance, still have the instincts of their ancestors; they still love to have the trees about them and the open sky above; and, now that such a large part of them are obliged to live in cities, they satisfy their longings for the open by frequent railway excursions to the suburbs, to the country, to the mountains and the sea. Railway travel in every country, and particularly among a nature-loving people, tends to grow with increasing rapidity as people change from rural to city life.

The freight traffic of American railroads, as the result of the general and special factors that have been considered, has several clearly marked characteristics which may be briefly summarized:

1. The tonnage consists mainly of bulk traffic; minerals contributing 53 per cent., forest products 11¼ per cent., and agriculture

8½ per cent.; while in addition to these three groups of commodities, which comprise nearly three-fourths of the total tonnage and which are mainly handled in bulk, manufactures, a large part of which consist of heavy articles shipped in car-load or train-load units, contribute about 15 per cent. of the aggregate. It is safe to say that not less than four-fifths of the freight traffic of our railroads is shipped in bulk in car-load and train-load lots.

2. The fact that these bulky commodities are transported long distances, much farther than in European countries, strengthens the tendency to use large cars and to haul heavy train-loads. Nearly two-thirds of the freight cars owned by American railway companies are of from 60,000 to 80,000 pounds capacity, eleven per cent. are in the 100,000 pounds class, and less than two per cent. are built to carry less than 40,000 pounds. Formerly the standard freight car in America had a capacity of 40,000 pounds, but now such cars include only 13 per cent. of the total number and less than 9 per cent. of the total capacity of our freight equipment. Moreover, cars belonging to shippers and private car lines and which are not included in the figures upon which these percentages are based, are of more than average size.

The contrast between American and European practice as regards size of freight equipment used, is most striking. Our small car of 20 tons (40,000 pounds) capacity is the size of their largest mineral car; and "wagons" of that capacity are in small demand. For ordinary freight in Europe a ten-ton "truck" is amply large, and coal, iron ore, and other heavy bulk traffic are regularly carried in fifteen and twenty-ton cars. The demand of the average European shipper and buyer is for frequent transportation in small units, rather than for a large and infrequent service. The organization of business in Europe is different from its organization in the United States, and the railroads in each section of the world conform to business requirements.

3. The heavy average freight train-load in the United States—350 tons, three and four times that prevailing in the leading countries of Europe—results naturally from the bulky character of the traffic, from the use of large cars, and from the long distances freight moves. This method of handling freight in large quantities also fits into the prevailing methods of doing several branches of business in this country, where it has been, and to a large extent still is, customary for manufacturers, dealers and merchants to place larger orders than is the practice with European business men. In the United States many, if not most, large buyers seek to secure com-

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modities at low prices and to save on freight rates by laying in a stock that will last some time; although, by so doing, storage facilities must be provided; but in European countries, at least in those with which comparisons have been made in the preceding paragraphs, the object of the business man is to tie up only a small amount of capital in his stock, and to minimize warehousing expenses. To accomplish these ends, he is willing to pay the higher freight rates which the railroads are obliged to charge for delivering goods in small quantities and for performing their frequent services with promptness and reliable certainty.

4. The large average train-load in the United States, furthermore, is in part the result of the fact that there is not only a large-scale production, but a union, in several instances, under one management of the business of securing, by mining or otherwise, the raw materials, of transporting the materials of manufacturing, and, to some though a less extent, of distributing the finished products. Iron ore is handled from mine to lake pier, and from lake port to furnaces in train loads of 2,000 to 4,000 tons; coal is shipped from mine to yard or port in long trains of fifty-five ton cars; and petroleum, though most of the crude oil now moves unseen through underground pipes, still adds its tank cars in part train- or whole train-loads to the traffic of the railroads.

5. To the two causes just cited to account for the large train-load in the United States there should be added the third and equally evident fact that in our wide-reaching country, with its vast and varied productive output, products such as grain, live stock and cotton are brought together in great primary markets, like Chicago, Kansas City, Atlanta and many others, the traffic pouring into those reservoirs in streams, sometimes large and sometime small, but flowing out in enlarged channels to domestic centers of distribution, from which consumers are supplied, or to the seaboard exits of our exports. Trains loaded with cotton, grain, or refrigerated provisions move from the interior to the seaboard; likewise train-loads of our fruits travel from Florida or California to New England, while tropical fruit trains are run from New Orleans and the north Atlantic ports to the interior of the country.

The traffic conditions, here briefly stated, determine what the character of the freight service of American railroads must be and establish the principles controlling rate making. American railways are compelled to render services unlike those demanded of European roads, and the rates charged for those services must not only average low, but must be so adjusted as to permit and facilitate a traffic

intercourse of large volume between places separated by continental distances. Rate making must harmonize with services to be performed.

The passenger traffic of our railroads is characterized:

1. By the absence of the definite division of the service into three or four classes, as is the practice in Europe. The chief reasons for this difference are, however, to be sought in economic conditions that must change with the growing density of population in the United States. It seems probable that American and European practice as regards the classification of passenger traffic will differ less as the economic and social conditions in the United States approximate those in Europe.

2. The general ideal, to which American passenger traffic managers adhere, of a service of maximum speed and comfort (unfortunately, maximum safety of travel has not been such a definite part of the ideal), while resulting in a standard of excellence of which there is much reason to be proud, has not permitted our railroads to cater to the masses of the people by offering them a cheap service—regular and frequent, though slow, and not in anywise luxurious—such as is provided by the third and, to some extent, in the fourth class in Europe. Until an inexpensive service, such as this is regularly offered on all the ordinary passenger trains, with the exception of the express and extra-fare trains, it does not seem reasonable to expect the large expansion in traffic that can come only with the greater use of our railroads by the wage-earners and other persons of small income. To socialize passenger travel, this cheap service is required.

3. The United States, as a whole, being relatively sparsely populated, as compared with European countries, and the average distance between towns and cities being long, the passenger traffic of American railroads, though large in the aggregate, is spread over such an extensive line mileage that the density of traffic, as measured in the number of passenger-miles per mile of road, is much lower than in several other countries. In France, the railroads have a density of passenger traffic nearly three times, and in Germany almost four times, as great as our lines have; while a comparison with Great Britain, if the necessary figures were to be had, would show a still higher ratio against our railroads. When one considers that only one-fifth of the total earnings of American railroads is derived from fares and that only one-fourth of the revenues is secured from the operation of passenger trains—from passengers, mail and express—it is evident that the passenger service in this

country is still relatively undeveloped, and that its future growth offers the possibility of a large increase in the traffic and profits of the railways in the United States.

4. That the average length of the passenger journey should be greater in the United States than in more thickly settled countries is to be expected—it is more than double the average trip in Germany and about one and four-fifths the average for France—but that the length of journey, despite our growing density of population, should have increased twenty-four per cent. during the past decade, while the average in France and Germany has remained practically stationary, is a less obvious fact. The explanation lies in the large development of electric railways in the United States and the transfer from the steam railroads to the electric lines of a large share of the short-distance suburban and interurban traffic. In Europe there has as yet been but a small mileage of electric railways constructed, and the steam roads still handle such a large volume of short-trip traffic as to keep the average length of journey at a low point.

Passenger fares, as well as freight rates, are the product of traffic conditions, and of the methods followed in performing the services rendered to meet those conditions. The relative sparseness of population in the United States, with the consequent low density of passenger traffic per mile of railroad, the policy of not dividing the services into classes but of providing all or the great majority of travellers with speed and luxury as well as comfort, and the necessity our steam railroads have of sharing much of the short distance traffic with the electric lines, cause passenger fares to average higher in the United States than they do in several foreign countries. For services of the highest grade, our railroads have as low fares as are to be found abroad, and probably our best services excel those in other countries; but our neglect to provide facilities for cheap and slow travel results in relatively high average fares.

The freight and passenger services of American railways are characterized by a high degree of efficiency. The development of railroad transportation in the United States, shaped by economic needs and social conditions, has not only kept pace with the progress of the country, but has done much to make possible the nation's marvelous advance. In the freight service the accomplishments of inventive and administrative genius have possibly been more notable than in the transportation of passengers; but in both departments there has been a most successful adaptation of means to ends.

# GEOGRAPHICAL RECORD.

## AMERICA.

THE HUDSON-FULTON EXHIBITION AT THE SOCIETY'S HOUSE.—At the request of the Hudson-Fulton Celebration Commission a collection of books, maps, etc., relating to Henry Hudson, Robert Fulton and their times, was placed on exhibition in the lecture hall of the building of the American Geographical Society, to continue during the period of the celebration. A catalogue of 40 pages was also prepared containing fac-simile reproductions of title-pages from the books of Hessel Gerritsz and of Purchas, and a frontispiece reproduction of part of the text describing Hudson's fourth voyage as printed on the back of the Gerritsz chart in 1612, believed to be the first description in print of any of Hudson's voyages. The catalogue is alphabetical, but the exhibit is arranged, as far as practicable, in chronological order. Beginning with a description of Verrazano's entrance into New York Bay, a map (reprint) is shown which gives *"R. de s:. antonio,"* the early name for Hudson River, and another map in Wytfliet giving *"R. de gamas,"* by which name the Hudson was also called by the Spaniards. A portion of a reprint of a *"Map of the World"* by Jodocus Hondius is shown on which occurs a mention of Hudson (1611), *"Glacies ab Hudsono detect Anno 1608,"* believed to be the first record in print. A reprint of the book of Hessel Gerritsz is shown, and the originals of *"Purchas his Pilgrimage,"* 1617, and *"Purchas his Pilgrimes,"* 1625, the latter containing a map on which *"Hudson's R."* is marked, the first known application of the name in print. A copy of the first edition of De Laet's *"Nieuvve Wereldt,"* a very rare volume, 1625, is also in the exhibit and a map of the same period by Abraham Goos, 1626, showing, *"Hudson's Rio."* In addition there are many volumes and maps by Heylyn, Monsen, Blaeu, Visscher and others relating to the Hudson period, while in the field of Fulton, Colden's *"Life of Fulton"* and the plagiarization of it by Reigart are shown. A volume of the work by Parkinson, *"A Tour in America,"* which so roused Fulton's ire, is also shown and there are many works relating to Fulton and his inventions, in one of which is stated Fulton's prediction that "steam carriages" would eventually cross mountains as easily as a stage coach could run on a level way. Catalogues may be had on application.

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WRECKED IN THE COLORADO CANYONS.—On June 12th Messrs. Tom Martin and J. B. Woodward of St. Louis started from Green River, Wyoming, to descend the Green and Colorado Rivers in a specially constructed row-boat, over the course followed by Major Powell in his voyages of 1869-1872. Mr. Martin writes to a friend: "We were completely wrecked in the Lodore Canyon, barely escaping with our lives. We spent three days and three nights in the canyons without shoes, having only a pair of trousers and an undershirt each, one side of raw bacon, no matches and no place to sleep. We at last reached Linwood, Utah."

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SOIL SURVEY OF MISSOURI.—The U. S. and Missouri Soil Surveys will cooperate in the survey of the soils of Missouri. Professor C. F. Marbut, director

of the Missouri Survey, will be in charge, and each survey party will consist of a man from the Federal and another from the State survey. The Federal survey will meet the expenses of publication. It is expected that from four to five counties will be surveyed each year.

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## AFRICA.

THE MUFUMBIRO VOLCANOES.—The paper read by Major R. G. T. Bright, of the British-Belgian Congo Boundary Commission, before the Royal Geographical Society, on June 14, 1909, says that the positions of eight of these volcanoes were trigonometrically fixed by the Commission. The volcanoes lie between lat. 1° 20′ and 1° 30′ S. The altitude obtained for the highest peak, Karisimbi, was 14,794 feet. The volcanoes were quiescent, with the exception of one lying a considerable distance to the southwest. Dense volumes of smoke rose from it and the flame was visible at night from Katwe. Owing to the clearness of the atmosphere during the rainy seasons, Mufumbiro can be seen from the north for at least 120 miles. This name is applied to the whole of the volcanic region by the natives living to the north. The name is derived from three Bantu words meaning "Cook in place," and is given to the volcanoes on account of the smoke issuing from their craters.

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CHANGES IN AFRICAN NOMENCLATURE.—On his expedition across Africa for the relief of Emin Pasha, Stanley gave the name of Albert Edward to the large lake to the south of Lake Albert. It has been found that the application of the name Albert to both of these lakes has given rise to some confusion between them. King Edward has therefore approved of a proposal to call Lake Albert Edward simply Lake Edward; and the northeastern extension of this lake will hereafter be known as Lake George, after the Prince of Wales.

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DEMARCATION OF THE BELGIAN CONGO-UGANDA BOUNDARY.—Difficulty has, for some time, existed over the boundary between the Belgian Congo and the Uganda Protectorate. The original agreement was concluded at a time when the districts concerned were very little known and it was then decided that the 30th meridian should be taken as the boundary. In 1902, the Anglo-German Boundary Commission, which delimited the line between Uganda and German East Africa, discovered that the 30th meridian was actually about 11 miles to the east of where it had been supposed to be. The Belgian Government at once claimed all the intervening country, a strip about 11 miles wide and 150 miles long. The British Government declined to recognize this claim, but it was agreed that, pending the exact location of the 30th meridian by a joint Boundary Commission, neither Government should exercise any active authority in the disputed zone. The joint British and Belgian Commission has now completed the demarcation of the boundary along the 30th meridian, and the controversy is at an end, which is fortunate, as the withdrawal of all European authority in the disputed district had thrown it back into anarchy and it became the refuge of criminals and disaffected natives. Major Bright, the head of the British survey party, describes the regions traversed in making the survey, in the *Geographical Journal*, Aug., 1909.

## EUROPE.

THE ELEVENTH INTERNATIONAL GEOLOGICAL CONGRESS.—The Committee which is arranging for this Congress, whose next meeting will be at Stockholm in 1910, reports further that there will be submitted to the Congress certain broad questions capable of being illustrated by the study of Swedish geology. Among these questions are: The Geology of the Archæan formations; changes of climate since the maximum of the last glaciation; and the extent and distribution of the World's iron-ore deposits. The special topic in regional geology will be the geology of the polar regions, and an excursion which will be provided to Spitzbergen will give the members an opportunity to see a part of them. The Congress will be opened about Aug. 18, but many of the excursions will begin about July 25.

## POLAR.

SHACKLETON PROBABLY COMING TO AMERICA.—It is now expected that Lieutenant Shackleton will visit this country in the latter part of March for a lecture tour, the proceeds of which will be devoted to fitting out his next Antarctic expedition. His numerous engagements in continental Europe will occupy his time till he sails for America. He has proven to be an accomplished platform speaker, he has a great story of exploration to tell and his illustrations are excellent. The British government decided, in August last, to contribute the sum of $100,000 to defray the indebtedness which Shackleton incurred in fitting out his first expedition. In a letter communicating the decision of the Government to Lieut. Shackleton, the Prime Minister said:

> The Government has been induced to take this course as they are much impressed both by the great value of the discoveries made in the course of your voyage and by the efficient and economical manner in which the whole of the enterprise was conducted, as is shown by the fortunate return of your entire party, and by the comparatively small total outlay incurred.

IN THE CANADIAN ARCTIC.—A note has been received from Mr. H. V. Radford from Fort McPherson, near the head of the Mackenzie River, dated July 13th. He started in February last from this city to visit the North West Territories of Canada, especially to study the wood bison and other large fauna. He reports that no whale ships spent last winter at Herschel Island. He expected to return south soon to resume the study of the wood bison at Fort Smith, and intends next year, to enter the Barren Grounds, northeast of Great Slave Lake.

DR. BRUCE'S NEW EXPEDITION TO PRINCE CHARLES FORELAND.—The Glasgow *Herald* announced (July 10, 1909) that Dr. William S. Bruce, of the Scottish Oceanographical Laboratory, had chartered the steam trawler Conqueror, at Leith, and was having her refitted for a scientific expedition to Prince Charles Foreland, Spitzbergen. In association with the Prince of Monaco, Dr. Bruce carried on two seasons' exploration work, especially as regards the topography, geology, botany and zoology of this interesting and little known island. He communicated papers to various scientific bodies on the results of these expeditions. The present expedition is a continuation of that work. He was to take with him a strong scientific staff, including Mr. J. V. Burn Murdoch, F.G.S.; Mr. John Mathison, of the Ordnance Survey Staff, Scotland, who was to act as chief surveyor; Dr. R. N. Rudmore Brown, late of the Scotia; Mr. Ernest A. Miller, who accompanied him on his first expedition to Prince Charles Foreland, and who

has since, under the auspices of the Argentine Republic, acted as meteorologist at a station in Scotia Bay, South Orkneys. Mr. Alastair Geddes, son of Professor Patrick Geddes, also accompanied the expedition.

## CLIMATOLOGY.

ANTARCTIC CLIMATE.—The recent Antarctic expeditions have brought back a splendid body of meteorological material which is being worked up, and published, with satisfactory promptness. The latest discussion along this line is by Dr. Ludwig Mecking, in *Petermanns Mitteilungen* for May, 1909, in which some of the results collected by the German Expedition in the "Gauss" are summarized. As a part of the final report of the scientific work of the "Gauss" Expedition, there have been prepared a series of synoptic daily weather maps for the period 1901-04, covering the area between latitudes 30° and 60° S. Dr. Mecking has obtained mean pressures for the summer (December, 1902,-February, 1903); winter (June-August, 1902), and year (October, 1901-March, 1904), and gives isobaric charts showing his results. Many interesting facts are brought out by these new charts. The low pressure north of the Antarctic Circle is seen not to be a simple, uniform ring, but there is a tendency to the development of two local minima, one in Weddell Sea and one west of West Antarctica, which is over what may be called the Belgica Sea. Between these two minima the Antarctic anticyclone stretches across the land area in the form of a wedge, tending to unite with the tropical high pressure belt over South America. The seasonal and annual changes in the positions of these centers of high and low pressure, and in the gradients, make it possible to explain many of the special meteorological conditions which have been recently reported by the various Antarctic expeditions.

R. DEC. W.

FLUCTUATIONS OF THE SEA OF ARAL.—In a recent review of the work of L. S. Berg, on the Sea of Aral, Dr. A. Woeikof summarizes the facts which are now at hand regarding the fluctuations of the water level of that sea (*Pet. Mitt.*, IV, 1909). There is evidence of climatic fluctuations, with a longer period than that of Brückner, probably at least sixty years long. Yet the author does not by any means claim that there *is* a period. Recently there was a general belief in a progressive desiccation in Central Turkestan. But so far as western Turkestan is concerned, such a general desiccation cannot be thought of. Climatic fluctuations there are, but it is not yet clear whether they are periodic or non-periodic.

R. DEC. W.

IS THE EARTH DRYING UP?—In the *Monthly Weather Review* for Dec., 1908, Prof. Cleveland Abbe makes the following answer to the question, "Is the earth drying up?":

> As for the secular diminution of rainfall, we venture to assert that neither meteorology, nor geology, nor any other branch of geognosy gives clear, unimpeachable evidence of the progressive drying up of our globe as a whole. The fact that great glaciers, lakes and rivers once covered regions now free from them merely shows that in such regions there was once a different relation than now exists between rainfall, snowfall, evaporation, and run-off, so that snow accumulated then more than now. At the present time there is more rain and less snow, or possibly more snow and more melting (possibly due to changes in altitude), so that the snow cannot accumulate. . . Glacial phenomena tell us nothing whatever as to the absolute quantity of rain or snow. We think it is safe to say that no

great changes in oceans, continents or plateaus, arctic or antarctic, are likely to have made any correspondingly great change in the rainfall of the globe as a whole, and that therefore the globe is not now slowly drying up.

R. DEC. W.

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CHANGES IN THE MONTHLY WEATHER REVIEW.—Dr. Cleveland Abbe, editor of the *Monthly Weather Review,* announces that, beginning with the issue for July, 1909, the *Review* will be restricted to statistical tables of general climatological data for the whole of the United States. The relatively small amount of accompanying text will summarize the weather conditions of the month in the different districts. It is thus evident that hereafter the *Review* will be of value only to those advanced students of climates, engineers, etc., who need detailed data for their own discussion.

Few papers of general interest to teachers, except as relate to climatology, will be published in the *Review,* and the scope of the articles will be limited to technical treatment of subjects of advanced research. This will make the *Review,* in Educational Circles, appropriate only for the libraries of colleges and universities.

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## ECONOMIC GEOGRAPHY.

INFLUENCE OF STATE-OWNED RAILROADS UPON COMMERCE.—While the higher cost of raw materials and labour in Germany are tending to diminish the competitive power of German manufacturers in the world's markets, the cost of transportation on the state railroads is working to their advantage. The system of state railroads has given to the Prussian and other German Governments the power to help manufacturing trades that may especially need assistance by giving them exceptional freight rates. Some industries in Germany have thus been actually kept alive, as, for example, the artificial stone industry, using as material artificial sand near the lower Rhine; other industries have derived much advantage, as, for instance, by the exceptionally low rates for the carriage of coal from the Rhenish-Westphalian coal districts to the Lahn and other places where iron ore is mined. The Tariff Board is chiefly engaged in examining the claims of applicant industries to have their goods included in cheaper sections of the railroad tariff. (*Report* of the British Consul-General at Frankfort on Main).

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## PHYSICAL GEOGRAPHY.

GLACIER MARGIN PHENOMENA IN ALASKA.—Prof. R. S. Tarr of Cornell University, after studying glaciers in Greenland, in the Alps, and in Alaska, finds that the ice tongues of the last locality throw the most light upon the interpretation of glacial deposits in United States (*Zeitschrift für Gletscherkunde,* Band III, 1908, 81-110). This seems to be largely due to the fact that in Alaska many moderately large ice sheets end on the land in a cool, temperate climate near sea level.

He presents facts from the Yakutat Bay region near Mt. St. Elias, where mountains 15-18,000 feet high rise from the ocean and where on-shore winds bring 190 inches or more of rain and snowfall annually. This results in large areas of snow fields and in many ice tongues, some of which are tidal and discharge icebergs, some end on the land, and some unite as piedmont glaciers whose stag-

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nant margins, blanketed by moraine, support forests, as Russell previously described on the Malaspina glacier.

The deposits on the glaciers (ablation moraines), the alluvial fans (formed by outwash in front of the melting glaciers), the kettle holes (being formed in these by slumping ice beneath), the subglacial eskers, the kames, the marginal channels, deposits of earlier ice advances, marine deposits, etc., are fully described. The complexity of marginal deposits through alternation of conditions, and especially in connection with the great advance started in 1905 and 1906 as a result of the 1899 earthquakes, is of especial interest. Professor Tarr shows conclusively that deposits, exactly analogous, except in weathering, to those which have been interpreted in the United States and Europe as evidence of interglacial conditions with complete deglaciation, are being formed to-day in the Yakutat Bay region. Peat has accumulated, soils have formed, and trees have grown on or close by ice sheets whose advance is now burying them with till.

He concludes that the Alaskan glaciers are of greater importance than those of Greenland, the Alps, Spitzbergen, etc., in presenting conditions analogous to those of waning continental ice sheets, because of the lessons taught concerning phenomena associated with the wasting of stagnant ice. L. M.

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Earthquake Forecasts.—As his Presidential address before the Association of American Geographers at Baltimore, Dr. G. K. Gilbert discussed earthquake forecasts (*Science,* Vol. XXIX, 1909, 121-138). He dealt with earthquake prediction with regard to place and to time. Having considered (*a*) experience, (*b*) bold and high ranges, (*c*) rifts and (*d*) geologic formations in relation to the *loci* of earthquakes, he showed that many malloseismic areas, or "localities likely to be visited several times in a century by earthquakes of destructive violence," are known "from records of past experience, and others are being recognized by physiographic characters. Within them are tracts of special instability because of the incoherence of the underlying formation, and these can be both characterized in general terms and locally mapped. The general relations of danger to space are so well understood that an early solution of their outstanding problems may be assumed."

The less satisfactory relations of earthquake forecasting were attacked by use of the ideas of (*a*) rhythm, (*b*) alternation, (*c*) trigger or starter, and (*d*) prelude. Dr. Gilbert concluded that "the hypothesis of rhythmic recurrence has no sure support from observation, and is not in working order for either large or small areas. Its corollary of local immunity after local disaster is more alluring than safe. The allied hypothesis of alternation between parts of a district is being tested by a great example, but the verdict belongs to the future. The hypothesis of precipitation by accessory forces which are in large part periodic and foreknown, has a good status and is being developed on the statistical side. It promises to make the date of prediction more precise if ever the approximate time shall be achieved by other means. The hypothesis of an intelligible prelude has barely been broached and the means to test it are not yet in sight. In a word, the determination of danger districts and danger spots belongs to the past, the present, and the near future; the determinations of times of danger belong to the indefinite future. The one lies largely within the domain of accomplishment; the other still lingers in that of endeavour and hope."

The moral drawn from these considerations by Dr. Gilbert is that it is "the duty of investigators—of seismologists, geologists and scientific engineers—to

develop the theory of local danger spots, to discover the *foci* of recurrent shocks, to develop the theory of earthquake-proof construction. It is the duty of engineers and architects so to adjust construction to the character of the ground that safety shall be secured. It should be the policy of communities in the earthquake districts to recognize the danger and make provision against it." L. M.

## VARIOUS.

HIGHEST ALTITUDE ATTAINED BY MAN.—The London *Times* reports that on Aug. 12, the Italian balloon Albatross, manned by Lieut. Mina and Signor Piacenza and starting from Turin, reached a height of 38,715 feet, at which point they opened the valve and began their descent. The highest altitude previously in a manned balloon was 35,500 feet, reached by Berson and Süring on July 31, 1901. The new record is equivalent to an altitude of 7.3 miles and shows the great heights that may now be attained by using the improved means of respiration that have been introduced within the past few years.

PERSONAL.—Professor R. C. Allen, of the University of Michigan, has been elected State Geologist to succeed A. C. Lane, who resigned the position to accept a chair in Tufts College.—Dr. W. F. King, chief astronomer of the Dominion of Canada, is at the head of the Geodetic Survey Department recently established by the government.—Dr. Heinrich Ries, professor of economic geology at Cornell University, will make a survey of the clay deposits of Canada by arrangement with the Canadian government.—Professor H. E. Crampton, of the American Museum of Natural History, made his fourth voyage to the Society Islands this summer. Thence he will go via Cook Islands to New Zealand, Tonga Islands and Samoa and will return by way of the Fiji Islands and Hawaii, arriving in this city in January next.—Professor Joseph P. Iddings, who prepared, during the past year, the first volume of his work on igneous rocks, has been spending the past summer in parts of Japan, China, the Philippines and Java, under the auspices of the Smithsonian Institution, for the purpose of studying the volcanic rocks of those regions in order to complete the second volume or descriptive part of his book.—Professor J. Paul Goode had a comprehensive article, "The Story of the Manchester Ship Canal," in *The World To-day* for June.—Mr. Frederick Monsen has been making ethnological researches among the desert Indians of Chihuahua and Sonora. Late in July he expected to visit Arizona for study among the Hopi and Navajo Indians, and after three months in their homes he planned to go to the Grand Canyon and try to photograph it by means of kites flying about 6,000 feet above the surface of the river. He will return to New York in November.—Mr. G. D. Harris has been appointed professor of paleontology and stratigraphic geology at Cornell University.—Dr. C. R. Beazley, author of the great work "Dawn of Modern Geography," has been appointed professor of History at Birmingham University, England.—Mr. H. Wichmann has succeeded to the editorship of the statistical parts of the *Almanach de Gotha,* formerly in charge of Prof. Dr. A. Supan.—Prof. Dr. Oskar Lenz, Professor of Geography at the University of Prague and well known for his extensive travels through the Sahara and in West Africa, has gone into retirement on account of long illness. He is now living at Sooss-Baden near Vienna.—Dr. Georg Gerland, professor of Geography at Strassburg, has retired from active service.

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# GEOGRAPHICAL LITERATURE AND MAPS.

(INCLUDING ACCESSIONS TO THE LIBRARY.)

## BOOK NOTICES.

**Remaking the Mississippi. By John Lathrop Mathews.** 261 pp., Illustrations and Index. Houghton Mifflin Company, Boston, 1909.

This book describes the Mississippi River and its tributaries and explains in a comprehensive manner the work which has been done upon these streams for the control of the waters and the regulation of the channels. The chapter headings show the scope of the work: The Mississippi System; The Hydrology of the System; Controlling the Major Bed; Levee Building and Maintenance; The Minor Bed: Regularization; The River Mouth; The Upper Mississippi; The Missouri; The Ohio, and Canalization; Lakes-to-the-Gulf; The Tributaries; The Utilization of the Channels.

The author is a strong advocate of the reservoir system as a corrective measure and, in the main, he treats of the possibilities of reservoirs in moderate terms. Occasionally he sees a vision of future prosperity which is not presaged altogether in the premises, thus:

"In the reservoirs thus established in the heart of the Bad Lands will be found, first, a steadying influence on the stream; second, a means of settling and collecting suspended earth; third, a source of supply for irrigation and of power for pumping; fourth, perhaps best of all, a decided influence on the climate, producing by evaporation an added moisture for the air, which will not be without its effect upon the surrounding country. Trees will be planted along the river banks; and the added moisture, aided by irrigation, will be used to transform such of the adjacent regions as can be reached by pumping into farm lands, and much of the rest into forest tracts, thus cutting down to a minor factor the erosion of the soil."

The writer has confined himself largely to the historical development of the works on the rivers and the description of the present stages of the works. The book will be found useful to anyone who desires a concise account of the Mississippi River problem. In it may be found detailed accounts of the various kinds of levees and revetments, descriptions of locks and dams used in canalization, an explanation of the function of the jetties, and much information concerning this extensive river system. The text of the book is more modest than its title.

R. M. B.

**Une Croisière sur le Nil. Khartoum-Gondokoro. Par Cap. E. A. d'Albertis.** 262 pp., many Illustrations and Map. F. Diemer (Finck & Baylaender Succ.), Cairo, 1909 (?). Fr. 5.

This is a new edition of the finely illustrated volume in which Captain d'Albertis described the journey by steamer between Khartum and Gondokoro as he saw the country along the Nile in 1904. The volume is brought up to date by an appendix. Part I, not noticed in the title, is a description of the Assuan reservoir and a statement of its economic influence upon Egypt. Part II gives the story of the journey on the White Nile and describes the country and the

peoples along its banks. The book is written with skill and care and will especially help those who wish to know the general aspects of the Upper Nile or to make the long excursion to Gondokoro, within about 5° of the equator.

**Die Geographische Verteilung der Getreidepreise in Indien von 1861 bis 1905. Von Th. H. Engelbrecht.** viii and 112 pp., 30 Maps, and 2 Diagrams. Paul Parey, Berlin, 1908. M. 5.

Contains tables showing the average prices of wheat, rice, maize and the other grains grown in India for ten-year periods, with a discussion of these data and a series of maps on which are printed the average prices of each cereal, for ten-year periods, in each of the grain-growing districts.

**The South African Natives, their Progress and Present Condition. Edited by the South African Native Races Committee.** xii and 247 pp. and Index. E. P. Dutton & Co., New York, 1909. $2.

In view of the vast importance of the native question in South Africa, this committee was organized in England, some years ago, to study the various phases of the question and report upon them. The chief results of its inquiries were printed in a book entitled "The Natives of South Africa." The present work is supplementary to the first volume. It does not go over the ground of the earlier work, but describes changes that have taken place in native affairs and gives the results of the most recent investigations. These two books, as well as the *Reports* of the Inter-Colonial Commission on Native Affairs of 1903-5 and the Natal Commission of 1906-7, are very important to all who wish to be well informed as to the socio-economic problems that have arisen in South Africa. The volume before us describes the remarkable economic and social changes now occurring among the natives, the progress of education among them, the recent developments in regard to taxation, and includes a chapter on the administration of natives in the various colonies by Sir Godfrey Lagden. On the whole, the book shows that the present conditions are improving for the natives and that they, themselves, are helping to bring about desirable changes. The book is crowded with facts and a full discussion of them.

**Die Italienischen Portolane des Mittelalters. Ein Beitrag zur Geschichte der Kartographie und Nautik. Von Konrad Kretschmer.** Mit einer Kartenbeilage. viii and 688 pp. and Map. Königliche Hofbuchhandlung Ernst Siegfried Mittler und Sohn, Berlin, 1909.

This volume is number thirteen in the series of publications issued under the general editorship of Professor Albrecht Penck and bearing the general title "Veröffentlichungen des Institutes für Meereskunde und des geographischen Institutes an der Universitat Berlin." Dr. Kretschmer is a leading authority in the field of historical cartography, and we have in this publication, a masterly work. It appears to be a sort of by-product of the author's studies and researches in Italian archives in the years 1890-1891, at which time he was gathering material for his monumental geographical work commemorating the discovery of America. This by-product is scarcely less important than the main product of those years.

Kretschmer gives due recognition to the scholarly work of Breusing, Fischer, Fiorni, Wagner and Nordenskiöld within this field, whose conclusions he frequently quotes. When entertaining a different opinion concerning certain doubtful points he gives a clear statement of the reasons therefor.

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In three main divisions the author has presented the results of his studies. The first of these divisions deals with the seafaring peoples of southern Europe to the close of the middle ages; the second with the marine maps of the middle ages; the third with the Italian Portolani, in which last division we find a discussion of the probable origin and of the character of the portolano, the portolan texts of such writers as Adam of Bremen, Morino Sanudo, Benincasas and others, concluding with a carefully prepared commentary on the nomenclature of the portolani, including practically every name given in the eighteen selected examples with explanations.

The portolan chart which is appended to the volume is a reproduction, reduced one quarter in size, of a fine parchment chart preserved in the Berlin Museum für Meereskunde, and is here described for the first time.

In the first main section the author briefly considers the character of the Mediterranean as a highway of trade for its border nations; navigation as understood in antiquity; the rise and expansion of Italian Mediterranean commerce in the middle ages. The section dealing with the marine maps of the middle ages is particularly noteworthy. As is well known, these charts have been variously described as compass charts, loxodrome charts, portolani, marine charts. They have certain common features—with rare exceptions are drawn on parchment, are crossed with numerous intersecting lines, and possess a nomenclature, chiefly coastal, in red and black. In the author's discussion of these and other characteristic features we find a most satisfactory study of these interesting charts. Though admitting that they made their appearance in Italy about the time the compass began to be used in navigation, the author does not agree that they owe their origin to the employment of that most useful instrument. He would object to the use of the term compass chart if the term compass is here considered as explanatory of origin. They were a development from earlier coastal sketches, the periploi, admittedly modified and improved with the increasing use of the compass. In this section there is a very interesting consideration of the influence which the compass came to exert on chart construction, particularly in problems of orientation, with an important reference to the significance of compass declination.

The author is inclined to reject the term portolano as one not appropriate for these charts. A portolano in the true meaning of the term is a harbour or port-book, as he well asserts, but he is willing to accept the term portolan chart. *Carta nautica* is the name employed in the early descriptions.

A list of seventy-five medieval marine charts and atlases drawn before 1,500 is given with a brief description of each, which description is exceedingly useful.

The third main section of the volume, dealing with the Italian portolani to the end of the middle ages, is more extensive than the preceding sections. The texts of these portolani are given, taking up over 300 pages of the work. A work of this character is a credit to German scholarship; American students of geography have scarcely entered this field. E. L. S.

**Die Eroberung von Mexiko. Drei eigenhändige Berichte von Ferdinand Cortez an Kaiser Karl V. Bearbeitet von Dr. Ernst Schultze.** 642 pp., Portrait, Maps and Plans. Im Gutenberg-Verlag, 1907. M. 6.

Cortez's account of his Mexican experiences reads like a romance of discovery and exploration. His story belongs to world history. Recognizing this Dr. Schultze, general editor of this series of memoirs, has selected the personal

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narrative of Cortez as volume 4, which volume he himself has prepared for the press. The printers have done their part in giving us a neat and attractive page with type that can be easily read.

Although we have recent editions of the Cortez narrative in English, we are told that seventy years have passed since the appearance of a German edition. Dr. Schultze has done his work with great care. His extensive critical notes make this issue one of great value. He who reads the Cortez story as it here appears will also want to read the footnotes.

Cortez, as is known, did not always tell the full truth concerning his enterprises, as for instance he omits an account of the massacre at Cholula, as he also does a reference to the execution of the ruler Guatemotzin on the capture of the capital of the Aztecs. Omissions in the story the editor of this volume has undertaken to supply from contemporaneous accounts. Considering the purpose for which this volume was prepared it is a commendable achievement. E. L. S.

**Die Reisen des Venezianers Marco Polo, im 13. Jahrhundert. Bearbeitet und herausgegeben von Dr. Hans Lemke.** Mit einem Bilde Marco Polos. Im Gutenberg-Verlag (Bibliotheken Wertvoller Memoiren, Vol. I edited by Dr. Ernst Schultze), Hamburg, 1908. M. 6.

This series of Memoirs, the editor expressly asserts, is intended more for the educated laity than for the historical specialists who will always wish to consult original documents.

He lays claim to an original plan in that he proposes to include in the series the most valuable memoirs of all times and of all peoples, in other words to select only those which have more than a temporal and a local interest. The issue of this series seems to be another response to the interest which students and the general reading public are increasingly manifesting in history as told by contemporaries.

Marco Polo's Book of the Kingdoms and Marvels of the East appears here in German dress. It is not a little surprising that so long a time has intervened since the appearance of the last German edition of this great travel narrative. In a sense one may therefore speak of it as timely.

Well edited as this volume appears to be, with an explanatory introduction and with copious notes, it does not take rank with that most scholarly English edition by Yule with Cordier's additional and up-to-date notes. This particular issue of the Polo Narrative is especially for German readers and cannot fail of favorable reception. There is a charm and lively interest which the story of the Polo travels will never lose. They were pioneers among the modern European explorers of central and eastern Asia, of what we have come to call the Far East. Of the governments, of the manners and customs of the people, of the riches of the distant Orient, they brought the first reliable information to the west. This cheap but well-printed edition will find readers. E. L. S.

**New Italy, Her People and Their Story. A Popular History of the Development and Progress of Italy from the Time of Theodorich the Great to That of Victor Emanuel III. By Augusta Hale Gifford.** ix and 332 pp., Illustrations and Maps. Lothrop, Lee & Shepard Co., Boston, 1909. $1.20.

He who takes up this little volume expecting to get therefrom anything like satisfactory glimpses of the Italian people from that early day named on the title

page to the present will be disappointed. It is little more than a pleasing general account of the history of the peninsula. In the preface it is admitted that the effort has been "to present distinguished Italian statesmen and scholars by their most distinguished deeds—leaving the reader to elaborate their lives from biographies and histories which take up topics in detail."

Apparently, somewhat overwhelmed by details when writing of recent and present day Italy in the closing chapters, the easy flowing style of the earlier pages is replaced by short, oft-times disconnected paragraphs and sentences.

It is flattering to the Americans to read that "on account of the great number of Americans who visit the country each year" we have one of the two main reasons why "Italy is one of the most discussed subjects of the day."

Doubtless the great majority of those who read this book, which admittedly has much to commend it, will not be overcritical of its accuracy or inaccuracy of statement. Its errors of statement are not particularly obtrusive, yet one is rather startled by an apparent allusion to a Gothic conquest of the entire continent when Theodoric "established communication through secretaries with all Gothic rulers throughout Europe." It is not quite correct to say that "Gregory the Great commenced the conversion of the Britons to Christianity," and it is the very common student error to speak of "Louis the Pious, Charlemagne's son, who succeeded him by the Treaty of Verdun in 843."

In the last three of the nineteen chapters we have a very brief consideration of improvements and modern institutions, military expansion and literature, with a word concerning the present Royal Household. E. L. S.

**On the Coromandel Coast. By F. E. Penny.** vi and 358 pp. and Index. Smith, Elder & Co., London, 1909. 10s. 6d.

The Coromandel Coast is a name introduced by the Portuguese a century before the English established their trading centers in India. It is applied to the southeastern coast of which Madras is the center. Mrs. Penny lived for years in that region and this is the latest of her ten books on various phases of the peninsula. The volume consists largely of interesting bits of history and anecdote relating to old and new times along this eastern coast. Here is a quaint bit of the history:

There was a village of Muckwas, peaceful fisher folk; and on the white sands in front of the hamlet two servants of the British East India Co. built a fort, in 1640, which they named Fort St. George. The company did not share the faith of its agents that this place would develop into a good trading point and the names of the guilty men and their offence are thus recorded in the "Black Book":

Frauncis Day. Blamed to be the first projector of the Forte of St. George. The worke begunne by Frauncis Day and paid for out of the Company's cash.

Andrew Cogan. To answeare the building of the fforte St. George, the charge whereof hath cost from ye first of March, 1630, to ye thirtieth of June, 1643, pagodas new 9250.

But the agents had made no mistake, and the above records now seem very amusing in view of the fact that the great city of Madras is spread around the site of the old fort.

This is a good example of the curious and interesting information with which the book abounds. It is largely a story of the olden and modern times, told in anecdotal fashion and dealing, in part, with the natives but more with Europeans, from the traders to the pioneer and later missionaries. It is a hitherto almost unnoted chapter in history depicting, in lifelike colours, the life and struggles of the foreign pioneers in the Eastern Empire.

**Studien über Gebirgspässe. Mit besonderer Berücksichtigung der Ostalpen. Versuch einer Klassification von Dr. Johann Sölch.** From "Forschungen zur deutschen Landes-und Volkskunde," Band 7, Heft 2, pp. 123–273. J. Engelhorn, Stuttgart, 1908. M. 8.

A work that will be of interest and value to all specialists in physiography. The subject of mountain passes, their genesis and classification, requires further study before the final word can be written upon it, but Dr. Sölch has made an important contribution to its literature. His book shows that the morphological history of passes presents many problems, some of which have been definitely answered, others may be hypothetically explained, while many require further investigation. He gives a copious bibliography of the subject.

**Conquering the Arctic Ice. By Ejnar Mikkelsen.** xii and 470 pp., many Illustrations, 3 Maps, Appendixes and Index. George W. Jacobs & Co., Philadelphia, 1909. $3.50.

This book will have a worthy place in Arctic literature. It records the work of the Anglo-American Polar Expedition (1906-7), including Mr. Mikkelsen's adventuresome return to civilization, by sledge, over the wastes of Alaska, in the winter of 1907-8, all his comrades, excepting Mr. Leffingwell, having returned by ship before the close of navigation in 1907. Mr. Mikkelsen and Mr. Leffingwell were the joint commanders of the expedition, which included only nine men with the small schooner, Duchess of Bedford, which proved not well adapted for hard arctic service and finally sank at her anchorage, Flaxman Island, on the north coast of Alaska, in the spring of 1907. The condensed history of the expedition and its work is given in the *Bulletin* volumes of 1906 and 1907.

The party suffered from inadequate equipment, but it did hard, honest work, and its results were worth while. Its main purpose was to sledge over the sea ice north of Alaska in the search for land which, for various theoretical reasons, was thought likely to exist. Only the two leaders and Storkersen, a sailor, with their dogs, took part in this sledge journey and they reached a latitude of only about 100 miles north of Flaxman Island, but they made a very significant discovery. They found that the continental shelf was very narrow, and, long before they reached their highest point, they stood above waters of oceanic depth, which, according to present theories, discredits the supposition that there is land to the north of that part of the Arctic. The journey over broken ice, heaped in pressure ridges, was a terrible one and most creditable to the men who accomplished it.

The book is the story not only of this journey, but also of surveys and travel along the northern coast of Alaska and its rivers, ethnological studies of the Eskimo, scattered along the coast for many degrees of longitude, winter and summer life there and Mikkelsen's remarkable sledge journey of hundreds of miles from the arctic coast southwest across Alaska. The work is most entertainingly written and the photographs, over 100 in number, are exceedingly good. There is no other book which, besides supplying a very readable account of arctic endeavour, also throws so much light upon all phases of life along the northern coast of Alaska.

**L'Amérique précolombienne. Essai sur l'Origine de sa Civilisation. Par Alphonse Gagnon.** 371 pp., and 55 Illustrations. Laflamme & Proulx, Quebec, 1908.

This book is a very readable study of prehistoric American monuments and races and of the resemblances which many archæological remains in America

bear to Oriental monuments. It is largely given to an excellent, condensed description of the remains found in Yucatan, Central America and Peru. The author also devotes many pages to a discussion of the antiquity of the American remains and shows that the architecture and ceramics of Peru recall those of the Egyptians, while the old edifices of Central America, Yucatan and Mexico disclose surprising analogies to those of Chaldea, India and Indo-China. The author believes that new discoveries and the progress of ethnographical science will tend to confirm his views as to the Oriental origin of the peoples who built the remarkable structures whose ruins are found in the New World.

**Handbook for Field Geologists. By C. W. Hayes, Ph.D.** Second Edition. ix and 159 pp., 18 Illustrations, Appendix and Index. John Wiley & Sons, New York, 1909. $1.50.

This little book, which may conveniently be carried in the pocket, is based upon the "Handbook for Field Geologists," which was published in a small edition for the use of the geologists of the U. S. Geological Survey. It contains the instructions given to these workers. It is gratifying that so practical and valuable a book is now within reach of the members of the State Surveys, teachers, mining geologists and others. It is clearly and simply written, and no one could be better qualified to write it than Dr. Hayes, who is Chief Geologist of the National Government Survey. As a great deal is packed into small space, there is no room for discussion of various methods or dubious points, but one approved method is given for solving various geological questions. A very helpful and suggestive feature is a set of schedules of the observations which should be made in studying land forms, petrology, geological structure, glacial deposits, ores and various kinds of economic material. The book is not meant merely for geological specialists, but also for advanced students, civil and mining engineers and other. Even campers out will find matter in it that is applicable to their needs.

**D'une Rive à l'autre du Sahara. Par Le Lieut. Maurice Cortier.** ix and 416 pp., 3 Maps, and 118 Photographic Reproductions. Émile Larose, Paris, 1908. Fr. 12.

This is one of the fine works on the Sahara that are now being issued by French publishers. They are all a revelation of the practically unknown, for they record the work of the French expeditions which, in the past few years, have been traversing many parts of the great desert on their camels, trained to fleetness. This transformation in methods of Saharan travel has made it possible to bring the predatory tribes under subjection and to pursue scientific research in peace and safety, with the result that the Sahara is now the largest contributor in Africa of fresh geographical information.

Lieut. Cortier is among the most prominent of the recent French travellers in this desert. The expedition he describes, like most of the others, had for its primary purpose the extension of France's influence throughout its vast, new domain, but nearly all of these parties have been equipped for geographical work. Cortier was one of the leaders in the Mission Arnaud-Cortier which, in 1907, crossed West Africa from Algiers to Cotonou on the Gulf of Guinea, travelling through the desert by camel caravan. His book is entirely given to the desert journey, much of the southern part of which was through almost unknown country. His pen pictures of the regions and peoples along the route are very vivid and many of his descriptions have a novel interest because they relate to objects

or conditions of which very little has been known, as, for example, the country of the Tuareg Ifor'as, a people and a region which only recently have been brought clearly into view.

Part 1 is a detailed description of the journey and Part 2 contains its scientific results filling nearly half of the volume. These chiefly concern the country and people of the Adrar, the Ifor'as. Ten chapters are given to this newly revealed part of the world in its geographical and ethnological aspects. The country, situated to the northeast of the northern bend of the Niger, is in the desert, but it is not desert. It is of the nature of a fertile peninsula jutting out of the sand wastes and through it extends the largest caravan route crossing the Sahara, for here the traveller may rest and find water and grass for his animals. Through it will extend the Trans-Saharan telegraph line and also the railroad from Algeria, if this ambitious project is carried out. The people are Mohammedans, have a literature of their own, and are more advanced in their social organization, customs and industries than most of the denizens of the Sahara. The book is finely illustrated and will fill an important place in the literature of the Sahara.

**Zur Einführung in den erdkundlichen Unterricht an mittleren und höheren Schulen. Anregungen und Winke. Von Dr. Felix Lampe.** 225 pp., and Index. Verlag der Buchhandlung des Waisenhauses, Halle a. d. S., 1908. M. 3.

One of the latest and best of the German Manuals for the use of teachers of Geography. The author discusses very fully the whole content of the subject, the preparation required by the teacher, methods of study and of class-room exercises, the uses of wall maps, atlases, illustrative material and other appliances, laboratory work, etc. American teachers who read German may derive many useful hints from this work. One idea, which is repeatedly suggested, is that the teacher, to be most effective, must be very full of his subject.

**Quer durch Island. Reiseschilderungen von Maurice von Komorowicz.** 139 pp., Photographs and Illustrations in Colours from Paintings by Cécile von Komorowicz and Kurt Albrecht. Schiller-Buchhandlung, Charlottenburg. M. 2.

A reprint, with additions, of articles appearing in *Globus*, Vol. 92. The author went to Iceland for geological investigations in the interior and the book is valuable for the glimpses it gives of the vast lava-covered areas which have been but meagerly described for the general reader, and for its descriptions of camp life in these forbidding lands. One of the most interesting chapters relates to the tragic fate of Dr. von Knebel and Mr. Rudloff, whom the author met a little before they were drowned, in July, 1907, in the crater lake Askja.

**The Argentine Revisited. 1881, 1906. By the late Rev. Donald M'Corquodale.** 110 pp., Illustrations. W. & R. Holmes, Glasgow, 1909. 2s. 6d.

The manuscript was prepared for the printer after the author's death. It abounds with keen observations chiefly on the agricultural conditions of the Buenos Aires and Entre Rios provinces and comparisons with similar conditions as he saw them 25 years earlier. He records remarkable progress and great increase in the value of agricultural and pastoral holdings, especially in the region near Bahia Blanca, whose development into a prosperous city and port is sketched. He emphasizes the advantages of emigration to thousands of his fellow-countrymen, whose qualities fit them to deal with pioneer conditions.

**The Fijians. A Study of the Decay of Custom. By Basil Thomson.** xl and 396 pp., 16 Illustrations and Index. William Heinemann, London, 1908. 10s.

To those familiar with earlier works by the former Premier of Tonga, particularly his sketches of Niuē and Tonga, this massive work will come as a gladdening surprise. It is not that the earlier works were not worth while—far from that, they were agreeable and interesting in every particular. But this volume, with no deviation from the interest of its forerunners, shows Mr. Thomson in the light of a careful yet eager investigator of obscure facts, a painstaking recorder, and, in the discussion of his observations, a keen dissector of the psychology of the infant races of mankind.

This work, after the lapse of exactly half a century, supplements, restores and supplants the classic work of the Rev. Thomas Williams, "Fiji and the Fijians." There is not in this statement such contradiction in terms as might appear. Williams seems to have been an accurate and wholly uninspired observer of the savage life in which he passed thirteen years. His original manuscript has gone beyond recovery. Before it came to print it was placed in the hands of George Stringer Rowe, of whom our only knowledge is that he was a pious hack. The result of his untempered zeal is that "Fiji and the Fijians" presents to us only so much of what Williams saw as George Stringer Rowe considered fit reading for the evangelical fireside. In his official position Mr. Thomson, as a member of the British government of the colony of Fiji, has had access to the scarcely changed interior of the great island (Viti Levu) and has been able to subject to his study practically the same conditions as those which confronted Williams. Therefore it is proper to say that he restores Williams so far as that may now be done, and that he supplants the sanctimonious impertinences of George Stringer Rowe. Possibly, through his ability to write intelligibly in Latin, he has recorded facts which Williams most probably would have omitted.

In discussing the almost vital question of the Polynesian content of the culture and speech of the Fijians, Mr. Thomas quite properly oversets the conclusions arrived at by Fornander, that the great sweep of Polynesian migration reached Fiji and sojourned there for a fixed number of generations between such and such other centuries of the early Christian era. Fornander was a careful recorder of Hawaiian historical data, wholly unfamiliar with the histories of Nuclear Polynesia, and in his philological disquisitions entirely committed to the untenable hypothesis that the Polynesians are an Aryan race of an earlier stage of development than the Sanskrit family. But Mr. Thomson equally errs in ascribing the Polynesian content of Fiji to westward drift from Samoa and Tonga. From investigations upon this subject, of which the results with no great delay will be available to the general student, we have established that the Polynesian race entered the Pacific in two streams, over different routes and sundered by an uncertain but long lapse of time, that they came together in Nuclear Polynesia and particularly in Samoa. For the later stream we have adopted the name famous in Samoan history, the Tongafiti migration, probably about 1,000 A. D. We do not yet know the earlier course of this migration between Halmahera and Samoa, but we have established that it did not follow the Melanesian track nor did it touch Fiji.

The earlier, the Protosamoan migration, was perhaps a thousand years earlier than the later. This followed a double track. That which emerged from Indonesia through the eastern portal between New Britain and New Ireland, coasted

through the Solomon Islands, leaving numerous crop colonies, touched Deni in the Santa Cruz group and thence covered the gap of sea to Samoa without touching Fiji, lying southward of its course, but did influence Rotumā. The second track, emergent from Indonesia through a southern gate, follows Torres Straits, then along a track parallel but to leeward reaches the New Hebrides and thence comes to Fiji. Not only do we identify in Fiji the migration along this track of the Polynesians, but there is compelling evidence that even the Melanesians, with a far poorer marine equipment, passed along it from the New Hebrides to Fiji. Mr. Thomson, therefore, understates the moment of the Polynesian influence upon the Fijians.

Attention should be called in the interests of accuracy to the fact that the notice of the palolo worm is based upon ignorance of that marine animal. For ten years we have had the classic monograph by Dr. Woodworth of Harvard identifying the animal and recording its life history.

In his official work Mr. Thomson has been in intimate contact with the transformation of Fijian custom under the new conditions of British rule. He is by no means enthusiastic in his comment upon the efforts of the honest and unguided missionary and of the equally honest and quite misguided administrator to adjust the Fijians to an alien culture system. He does not attempt the suggestion that it might have been better to adjust the system to the people; he writes down the saddening record of what is the result of stretching a race upon the bed of Procrustes.

We have struggled earnestly to comprehend the complications of the Fijian system of kin. It is a great contribution that Mr. Thomson has made in this volume. He has shown a simple clue which explicates the tangle. Not only has he cleared up the hitherto unsolved problem of why a Fijian is under tabu against marriage with certain individuals and to others possesses so strong a marriage right that it outlasts even an existing marriage to another, but he has shown how the Fijian system fits into its proper place in the general theory of wedlock.

Students of the genesis of real property will find equal clarity in his elaboration of ownership in fee and usufruct, of life rents and the passage of title.

The work is a monument of scholarship in a field scantily known, yet of surpassing interest. We could wish the absence of a few inaccuracies in Fijian words which might mislead scholars to whom the language is unfamiliar.

WILLIAM CHURCHILL.

**The Chinook Jargon and How to Use It. By George C. Shaw.** xvi and 65 pp. Rainier Printing Company, Seattle, 1909. $1.50.

A very valuable service has been rendered by the publication of this manual and lexicon of the jargon. As much as in the days of the fur traders who were largely concerned in the formation of this trade language, which has perhaps received more study than any *lingua franca,* there is daily need for this work in our Pacific northwest among those who are brought into contact with the Indians. Apart from the difficulty which any Indian speech entails upon the higher race there are so many diverse tongues from Oregon to British Columbia and the range of each is so limited that facility in one or two would offer no practical advantage. But the jargon is comprehended by scores of Indian tribes; it fills a place corresponding to that of English in major commerce or of Hausa in Africa.

The standard authority upon Chinook, the jargon, was the vocabulary by George Gibbs which the Smithsonian printed almost half a century ago. This is

long since out of print and inaccessible. All of Gibbs is included in this volume; furthermore, all of every authority is here included, for Mr. Shaw knows the jargon with not only a facility but an appreciation which it is given to few to attain. For the first time it makes accessible the manuscript dictionary by Eells, the unavailability of which hitherto has been a source of regret. The arrangement of the material in long paragraphs is unfortunate; it does make the use of the work more difficult and the economy effected can scarcely have amounted to so much as a single signature in the whole volume.

It is not only as a proper tribute to the author that we venture the record that "Boston kumtuks hyiu lalang" shows that he is an American linguist. It illustrates to the curious the nature of the jargon, the first word English, the last French and two Nootka words between and each from a different dialect source.

W. C.

**The Great Lakes. The Vessels that Plough Them: Their Owners, their Sailors and their Cargoes. With a brief History of our Inland Seas. By James Oliver Curwood.** xvi and 227 pp., 72 Illustrations, Map and Index. G. P. Putnam's Sons, New York, 1909. $3.50.

This book describes, in an interesting way, the commercial status of the Great Lakes. It is a story of great achievements; to some it will be a marvelous story, but to the majority of the people in this country, in touch with the mighty industrial movement and little inclined to be stirred to enthusiasm by such an array of facts, the detailed account of the ships and the cargoes will not bring any great amount of wonderment. At the same time, the development of the commerce of these inland seas, as pictured by the author, is astonishing even in this country of rapid growths.

The author introduces us to the work with a description of the ships which ply the waters of the lakes. Then in detail and with many figures are arrayed the cargoes; the ore and the ore mines, the lumber and the spoliation of the forest lands of Michigan, the wheat and the opportunities in the future development of the plains of the Northwest, and, finally, the passenger traffic. So attractive is the story up to this time that one resolves to take the lake trip at the earliest opportunity; but the author suddenly changes his mood and tells of disaster and tragedy and forebodes more serious trouble in the times to come when the waters become more crowded, until resolution weakens and one feels content to read about it. The writer in his enthusiasm deals somewhat in futures which do not add materially to the value of the book. The prophecies for Buffalo and Duluth which are presented to the readers sound more like extravagances than judgments.

The closing chapters of the book contain the story of the battles waged on and about the Lakes, beginning with the conflicts of the Indian tribes and ending with the war of 1812. The illustrations are many and attractive. To a large extent, the subjects are ships—the stages of construction, the processes of loading and unloading, voyages on the seas and tragic endings—but there are a few pictures which show the cities and resorts which border the Lakes.

R. M. B.

**The Columbia River. Its History, Its Myths, Its Scenery, Its Commerce. By William Denison Lyman.** 20 and 409 pp., 80 Illustrations, Map and Index. G. P. Putnam's Sons, New York, 1909. $3.50.

This book of the American Waterways series will appeal more to the historian than to the geographer, more to the general traveller than to the careful observer. The author in writing the book had another object in mind than scientific investi-

gation or commercial status. He has been consistent in his purpose "to convey to his reader a lively sense of the romance, the heroism and the adventure which belong to this great stream and the parts of the Northwest about it," and he has made an effort "to impress his readers with the majesty of the Columbia."

The book is divided into two parts. Part I deals with the history of the river region. The brief introductory chapter descriptive of the land is unsatisfactory mostly because of the attempt to condense into a few pages many things which need extensive elucidation. The climate of the region is discussed to the extent of one page and it is unfortunate that a persistent misconception is advanced in explanation of the small range of temperature. "As is well known, the Japan ocean current exercises upon the Pacific Coast an effect similar to that of the Gulf Stream on Ireland and England." Throughout the remainder of Part I, the author, the professor of History in Whitman College, is in his chosen field, and he presents the story of the growth of the region in a popular way, while the text is woven in the fascinating myths of the Indians.

Part II contains a description of the various portions of the river country under the caption "A Journey down the River." It includes an account of the Canadian Rockies about the sources of the river, and in turn are described the marvelous lake regions of the river in northeastern Washington, the fertile plains of the Columbia with their fields of wheat and fruit, the passage of the river through the Cascade Mountains, and, finally, the lower river and the City of Portland. The author apparently feels that words do not express enough, and he has allowed himself to use in many instances, and especially while describing the country around Lake Chelan, extravagant phrases, as "superlatively magnificent," "symposium of sublimities" and the like.

The illustrations are many and all of them significant and attractive, and they also tell an effective story of the wonders of the extreme Northwest. R. M. B.

**Teacher's Geography. A Syllabus and Note Book. Climates and Maps, with Practical Exercises. By Mark Jefferson,** Michigan State Normal College. 2d Edition. Ypsilanti, Mich., 1909.

Professor Jefferson's practical exercises in geography were designed to meet the needs of his students. They will, at the same time, be found useful by many other teachers who want a series of definite, clean-cut, systematic laboratory exercises in meteorology. There are nineteen well-selected exercises on climatic subjects; five on map-drawing, and then a set of useful questions on a series of world diagrams showing distribution of population, temperature, provinces, rainfall and plant regions. We are especially glad to note that the author has included the excellent classification of climates in relation to vegetation proposed by Köppen in 1900. A reproduction of Köppen's original map was published in the BULLETIN for July, 1905. The explanatory text which accompanies each exercise is brief, but clear and to the point. The book is likely to serve a useful purpose outside of the author's own class-room. R. DEC. W.

**Reisestudien aus dem Westlichen Südamerika. Von Therese Prinzessin von Bavaria.** 2 vols. Vol. 1, xix and 379 pp., 4 Maps, 3 Plates and 78 Illustrations; Vol. 2, xiii and 340 pp., 2 Maps, 3 Plates, 83 Illustrations and Index. Dietrich Reimer (Ernst Vohsen), Berlin, 1908. M. 20.

Her Highness, the Princess Theresa of Bavaria, has subjected the American continent to several successive visits, all of which have been somewhat fruitful in scientific results. To complete her survey she made, in 1898, a rapid tour through

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northern, western and a part of southern South America, the "Relation historique" of which is presented in two most attractive volumes, handsomely illustrated with full-page and other photographic plates and accompanied by maps that are as good, on the whole, as any usually accompanying books of that kind. In fact, it may be said that they are much superior, as could be expected from German work in cartography, so vastly superior to general mapmaking. The Princess has manifestly been inspired, in her book, by the example of Alexander von Humboldt, an example which it is always very safe to follow, only, when that example is misinterpreted into imitation of style, the result is sometimes awkward. The Princess overburdens her descriptions of the journey with an accumulation of scientific terms in botany, zoology, etc., and thus renders it unpleasant for the interested general reader. It may be said that in her accumulation of technical terms for plants and animals she reproduces in part the exuberance of tropical nature.

In the course of about six months, Her Highness "investigated" the French Antilles, Northern Venezuela, parts of Northern and Eastern Colombia, the coast and the Western Cordillera of Ecuador, Western Peru, Western and Central Bolivia, Western Chile, and after a rapid glance cast at the Argentine she returned to Europe. Her preparations for this journey appear to have been very ample and her companions (a lady in waiting, a gentleman and a male servant) very well chosen. It was, in fact, a thoroughly organized collecting tour, destined to enrich Southern German museums with material they had been lacking and, as a corollary, to enrich German literature with geographic and even ethnographic data it might be in need of. It is the geographic value of the work that we have to consider principally.

The Princess lays no claim upon thorough hypsometrical and geodetic determinations. But she gives, what is more practically valuable, a detailed description of the scenery traversed by her, calling proper attention to critical landmarks that sometimes escape the attention of writers. She clothes that scenery with organic nature in a manner that sometimes becomes cumbersome, but still she maintains that relation between the basis of life and life itself that gives its proper value to geographical literature. In her orographic nomenclature she is not always fortunate, and cannot be expected to have been, owing to the shortness of time and lack of communication with the people. She was kept aloof from the latter by the very advantages which, through her high social position, she enjoyed in an official way. Mistakes brought about by the rapidity of her journey and her lack of intercourse with the people abound, and they are both geographical and ethnographical. Thus she confounds (as many other people do) the dome-shaped snowy mountain called "Hampatu" ("Toad," "El Sapo") with the Coropuna, which she calls the second highest peak of South America. Coropuna is not always visible plainly from the Arequipa Railroad. It is too far distant and may, therefore, be overlooked. As far as the altitude is concerned, it may be greater than that of Aconcagua, and it remains to be determined yet whether summits in the "Cordillera blanca" of northern Peru are not, perhaps, the highest of the whole American continent. The Princess persists in calling The Aymaras of Bolivia "Collas," not knowing that the term Colla is a Quichua word applied to the Aymara, who always call themselves and their language Aymara, also frequently pronounced by them "Aymára." For the reasons already indicated: rapidity of travel, lack of communication with the people, besides lack of knowledge of indigenous languages, the ethnographic and archæologic observations contained in her book remain well intentioned but superficial notices.

It is not so with natural history in general. Her book is specially valuable in regard to the geographic distribution of flora and fauna, the latter embracing every class of the animal kingdom, not excluding the lowest marine types. It will be an invaluable guide for the incipient explorer in zoology and botany in South America and the Princess must be heartily congratulated on the results of her scientific zeal in these fields.

Lack of time prevented the Princess from devoting as much attention to Chile as to other parts of the South American coast, and her trip through the Argentine was briefer yet, if we take into consideration the extent of territory and the distances traversed. While no criticism can be applied to something that, owing to inadequate time, was inevitable, we may regret that she could not bestow upon these two countries the attention she was able to pay to others. A. F. B.

**Wolfgang Lazius Karten der Osterreichischen Lande und des Königreichs Ungern aus den Jahren 1545-1563. Im Auftrage der K.K. geographischen Gesellschaft in Wien zur Feier ihres fünfzigjährigen Bestandes. Herausgegeben mit Unterstützung des K.K. Misisterums für Kultus und Unterricht von Eugen Oberhummer und Franz R. von Wieser.** Verlag der Wagnerschen Universitäts-Buchhandlung, Innsbruck, 1906.

This publication, issued in commemoration of the fiftieth anniversary of the Royal Geographical Society of Vienna, directs attention to the work of the founder of Austrian and Hungarian Cartography. It does not pretend to be a complete reissue of the literary and scientific output of that distinguished humanist. The editors have been actuated in great part by the praiseworthy desire to make better known the hitherto very little known map material which was Lazius's contribution to the history and the geography of his native land. From various important archives, public and private, which are designated, material has been drawn for reproduction. Though some of these reproductions are a trifle indistinct, on the whole the work is admirably done.

In the fifty-five double-column pages of text the editors give consideration to a brief survey of the life and work of Lazius, to Lazius as a geographer, to his special maps of the Grand Duchy of Austria, to the special atlas of the Austrian lands, to his fine map of the Kingdom of Hungary of 1556 and to the map of the battlefields of Hungary of 1556. There are twenty full and double page reproductions of maps with twenty-eight various maps and other reproductions which appear in the body of the text.

Lazius, as is briefly told, was one of the most distinguished humanists of the University of Vienna in the Sixteenth century. He had been trained for the medical profession, in which profession his father had won much repute. It was rather early in life that he became interested in historical, antiquarian, and geographical studies, within which fields his literary activities were confined. He is shown to have been one who approached his geographical studies rather from the standpoint of the historian than from the standpoint of the natural scientist—an historical geographer who found an intimate relation existing between man and his environment in the past as in the present.

Lazius's monograph on Vienna, the first as the authors say, written concerning that city, exhibits the geographical bent of his mind. In his most extensive work on Roman History in twelve books he placed great emphasis on geographical questions, as he also did in a minor work on Greece.

The principal geographical publications of Lazius are his maps, chiefly of his

own country. Before their construction he travelled extensively throughout Austrian lands and the border regions. His cartographical activities began about 1545 with maps of Upper and Lower Austria. The plan then conceived developed, in 1561, into his very significant atlas or "Typi chorographici Austriæ." In 1556, on command of the Emperor, he produced his large map of Hungary, which is reproduced in the size of the original.

In a special chapter the authors consider the general question of Austrian cartography, noting what had been achieved before Lazius and how much he added, which in reality entitles him to be called the founder of Austrian cartography.

In the preparation of his Atlas or "Typi," Lazius had constantly in mind the historical conditions of the provinces described, and as a result, so the authors affirm, we have here one of the oldest examples of an historical atlas. The maps of this Atlas are what the Germans call "Plankarten," not being drawn to scale. Each is oval in form and has as a sort of encompassing background the Austrian Coat of Arms.

This elaborate map border ornamentation is quite characteristic of the age, and it is not infrequent that one finds here a high order of the engraver's art exhibited. The Lazius borders are, however, much inferior to the Italian workmanship of the day, but the authors note that his maps give us examples of some of the earliest copper-plate work in Germany. True to his conception of geography, Lazius has peopled each of the title-pages to the several provincial maps with the folk of an earlier day—warriors, rulers, peasants, characteristically clad. The text of our authors briefly describes each of the twelve maps, pointing out their chief characteristic features. In chapters of adequate length the map of Hungary and the map showing the battlefields of 1556 are each described, it being clearly pointed out that Lazius was pre-eminent among the German map-makers of his day and lent an influence which reached well on into the Eighteenth century. E. L. S.

**Daybreak in Turkey. By James L. Barton, D.D.** Second Edition. 294 pp., Illustrations, and Index. The Pilgrim Press. Boston, 1908. $1.50.

In view of recent events in Turkey, astounding and unique in some respects, new books on that country are of timely interest, and contributions from authoritative writers are a welcome addition to the literature on the Ottoman Empire. It has become a fixed habit to look upon Turkey as a moribund country and to disparage its people. Several excellent works published since the promulgation of the Constitution will, no doubt, help to dispel a great deal of misapprehension about Turkey.

It is always hard to understand a conglomerate country and this difficulty is much greater in the Turkish Empire, which differs from all other lands. This is the reason why such widely divergent opinions are held by casual travellers. The author of this volume has lived in Turkey for many years, has been a careful student and observer of life in all its phases, and his work shows thorough familiarity with the social, economic, religious and political conditions of the country. The book, with the exception of the last chapter, was written before the revolution, and it is therefore all the more interesting to follow in it the various causes which brought about the present situation and trace the working out of the forces which led to the overthrow of the old *règime*.

Each chapter is prefaced with copious quotations from different writers on Mohammedan lands, such as Lord Cromer, S. M. Zwemer, and others—an excellent idea, calculated to give the reader either different points of view or uniformity of opinions on some questions.

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Dr. Barton begins with a condensed description of the Empire and the regions under its indirect control. These countries, in his opinion, possess more antiquities and historical interest than most other parts of the world. Moreover, there is no other region presenting so much material for students of classic and religious traditions.

Turkey is a land of great resources; few countries have richer soil, yet the general appearance is that of extreme poverty. Forests have been denuded of timber, and most primitive methods of agriculture prevail. In spite of these drawbacks, Turkey exports more foodstuffs than she imports; and wheat, barley, tobacco of excellent quality, and all kinds of fruits are produced in great quantities. Minerals are found in great abundance, but as minerals are government property, mines remain undeveloped and no private mining enterprises are permitted. There are few wagon roads, and these are always in poor repair. A famine may prevail in a district with abundance of crops 200 or 300 miles distant. Plans for building railroads have been thwarted by the ex-Sultan time and again. In a conversation with an official upon the subject of railroads the writer was told that he and the Sultan fully understood the value of good railroads, but permission to foreign capital to build them meant curtailment of the authority of the Sultan. This attitude of the Government, in all lines of development, has been alone responsible for the poverty of the land.

A brief historical sketch is given of the rise of the Ottoman Empire, its period of greatest prosperity in the Sixteenth century, the arrest of conquest, the gradual dismemberment and the Ottoman clan which governed in unbroken succession from the Thirteenth century to this day. The founder of the dynasty, Othman or Osman, was the first to begin the systematic organization of his government. The Janissaries, a military organization, famous for their conquests, were established by him. "The present methods of administration of the Ottoman Empire are due, in no small measure to the despotic nature and fanatical character of the Janissaries." It will be remembered that it was found necessary to destroy this dreadful organization in 1826 because it aspired to exercise authority even over the Sultans themselves.

In discussing the deposed Sultan, Dr. Barton calls him "the most phenomenal person sitting upon the throne to-day." Unprincipled, unrighteous, he managed to defy and outwit other rulers, to keep his Pashas in constant fear and to exercise absolutism to the fullest extent. What was the reason of his being able to hold the throne under such circumstances for over thirty years? The reason was that Abdul Hamid II did more than any of his predecessors to unify the entire Mohammedan world. Without this religious power, he would be a weakling.

Chapters devoted to races and race questions in the Turkish Empire throw light on this subject little known to general readers. Mohammedanism is the one unifying force in the Empire. Whoever embraces Islam becomes a Turk, irrespective of nationality. No other attempt has been made to amalgamate the races. The author says that only by knowing these races is it possible to grasp the problems confronting Turkey. The Nusairiyeh, "perhaps the most degraded of all the races in Turkey," live north of Syria. The Syrian Maronites, mostly located in Lebanon and Anti-Lebanon, became Roman Catholics under the influence of the Crusaders. The Druses, a mixed race, profess a religion resembling some of the faiths of India. The Jews are considered their inferiors by all the other races. Several pages are given to descriptions of the Syrians, the direct descendants of the early Christian Church, the Bulgarians, Armenians and the Moslem

peoples, such as Kurds, who came prominently before the world during the Armenian massacres of 1895, the Albanians in Macedonia, a vigorous and sturdy race, who long terrorized the Government and at the same time have been its source of largest support. Many of the finest men in the Turkish army are Albanians, and many have risen to the highest offices in the land.

America's attention was attracted to Turkey as a field for missionary work at the end of Eighteenth century. Owing to its strategic and geographical position there is hardly any other country, Dr. Barton thinks, more attractive for missionary labours. A detailed account is presented of the work done by the missionaries since the establishment of the American Board in 1810, and of the early pioneering, opening of stations, schools, and hospitals and the beneficial results attained by these institutions. The deplorable moral, social and religious conditions are attributed to the deterioration of Christianity. "In its conflict with Islam, Christianity was driven to the wall." The missionaries practically created the literature of the Bulgarians and the Armenians by unifying and simplifying the modern Armenian and Bulgarian languages. The influence which the missionaries now exert in Turkey is due, in great measure, to the excellent work of American physicians who enjoy the confidence of officials and the people.

In referring to political conditions, the author says that "The political situation can well be summed up as a Fifteenth century Oriental Government in conflict with modern civilization."

The final chapter, on Constitutional Government, was written after the Revolution of July 24, 1908. The vast system of espionage, the banishment and murder of the reformers, the underpaid and half-starved army were among the many direct causes that brought on the revolution. The vivid description of the scenes which took place upon the announcement of the Constitution add an intensely human touch to the story.

It is to be regretted that the volume is somewhat marred by religious bias. Squabbles among various Christian churches in the East have been a matter of criticism by the world at large, and the less said about them the better. The opinions of persons who see in Christianity the only solution of difficult social questions in Turkey seem bigoted. There is no reason why many undesirable features of Islam should not be eliminated under the severe searching test of modern requirements. The Revolution showed a tremendous moral force, the Young Turk party includes men of the highest character who have risen by power of ability, and now that the people are relieved from intolerable conditions and the new government is the antithesis of the old, there is every reason to hope that after the first confusion and ferment of ideas is over, the Turks will work out their salvation on their own lines without outside interference. The nation is eager to welcome progress and all that progress means. H. DE H.

**La Production du Coton en Égypt. Par François Charles Roux.** viii and 410 pp., 3 Appendixes and Bibliography. Armand Colin, Paris, 1908. 7.50 frs.

This exhaustive book will be welcomed as a most desirable addition to the literature of cotton because it deals with a variety of fiber whose production is, thus far, practically confined to Egypt—a long, fine fiber, especially adapted for thread, fine yarns, underwear and hosiery and so much in demand that the manufacturing nations cannot yet get enough of it. The product has been increasing and is now annually about 200,000,000 pounds more than 15 years ago. His study

of the future of cotton in Egypt, with which the author concludes the book, points to the probability that, by the utilization of large areas which will be adapted for cotton raising by the extension of irrigation, and the development of other favourable factors, the production of the fiber will be largely increased.

Mr. Roux's book is the result of a very careful study of the Egyptian cotton question on the ground and a summarization of all the documentary and other evidence bearing upon it. He treats the topic in its agricultural, industrial and commercial aspects; takes the reader to the cotton fields, the ginneries, the transportation routes, the factories and the cotton exchanges; discusses the questions of irrigation, the substitution of canals for the basin system, the influence of the new reservoirs; and prefaces this unfolding of the present conditions by outlining the history of Egyptian cotton culture from its origins, tracing its development and noting the vicissitudes, internal and external, that have marked the progress of the industry.

The book is an adequate and authoritative treatment of an important chapter in economic geography, and it will be useful in this country and in all the nations that derive a part of their cotton supplies from Egypt.

**Leitfaden der Kartenentwurfslehre. Für Studierende der Erdkunde und deren Lehrer. Bearbeitet von Prof. Dr. Karl Zöppritz.** 2nd Edition edited by Dr. Alois Bludau. Part 2: Kartographie und Kartometrie. viii and 109 pp., 14 Illustrations in the text and 2 Plates. B. G. Teubner, Leipzig, 1908. M. 3.60.

Part 1 of this important work, which appeared in 1899, dealt with map projections. Part 2 is given to a description of and comment upon the various kinds of topographical and geographical maps, including many details as to the special purposes each is intended to serve, methods of representing land forms by contour lines, hatchings, colours, light and shade, etc. The book differs from many treatises on map-making in the fact that it is not confined to generalities, but gives an exact and very detailed account of all the approved methods of expressing all kinds of information on topographic and geographical maps, the idea of the author and editor being that a thorough and competent student of the two volumes of this work will be able to prepare a map ready for the engraver.

The present volume clearly shows, what few general readers of maps know, that hatching which is worth anything is scientific, for the angle of elevation may be calculated from the density of the hachures. This kind of work is very different from the hatching that is seen on most of our home atlas sheets, which merely indicate, as a German critic expressed it, that "mountains are there or thereabouts."

Of course, geographers know that the common method of ascertaining the areas of considerable parts of the earth's surface is by measurements on the best geographical map sheets. It is gratifying to see that this book contains a fine section on cartometry. Directions are given for the measurement of angles, distances and areas by calculation and by the use of instruments such as planimeters, millimeter sheets, etc. In fact, this work is one of the best that has been produced for showing how good maps are made, how to read them and how invaluable they are for the scientific study of geography to those who know how to use them. An English translation of these two volumes would certainly be very useful in our normal and higher schools. It is an encouraging sign that many of them now desire to give more attention to the hitherto neglected subject of cartography, and here is a work that would be of the greatest helpfulness.

**Les Touareg du Sud-est l'Air. Leur rôle dans la politique saharienne. Par Lieut. C. Jean.** 361 pp., 2 Maps and 120 Illustrations from Photographs. Émile Larose, Paris, 1909.

The publishing house of Larose is very conspicuous in the production of the new works of exploration that are giving us exact knowledge of large parts of the Sahara. This is one of the most informing books on the desert thus far published, and we are not surprised that the military expeditions of France are adding so much to geographical information when we read the verbatim instructions given to the party that was sent north from Zinder to occupy the oasis of Air. This party was not only to establish a station there, but the kind and extent of the historical, geographical and ethnological studies they were to undertake were minutely particularized. The book gives a full and illuminating account of Air, which is one of the two or three most important centers of habitation in the southern Sahara.

Part 1 (78 pp.) gives an historical *résumé* of the French expansion in the southern Sahara. Nothing has afforded a clearer idea of the patience, the prudence and the wisdom of France in her slow and tentative efforts to gain a firm foothold in her new possession, among populations largely hostile, than is found in these chapters. France, for example, made no move towards Agades, the capital of Air, till the Touareg Sultan and his people were convinced that the French would do them good; that the existing native government would not be disturbed; that it would be made easier to send animals, their only export product, to other oases and the Sudan; that communications with the north and with Kano, the nearest commercial emporium in the south, would be safe-guarded and improved. Confidence in the French had been established in Air before any effort was made to occupy it in 1904. Lieut. Jean believes his government was over-cautious when it ordered the withdrawal of its representatives from Air at the time the Powers were wrestling with the Morocco question at Algeciras. France did not wish, in that crisis, to have too many irons in the fire. The Sultan said to the French, as they were sadly hauling down their flag: "You are like a man who has built him a house. He may leave his house, but he is free to come back to it, and so are you." The French found that this was true when they reoccupied Air in 1906.

Part 2 (181 pp.) is the chief and most instructive part of the book. It is devoted to the Air Oasis; gives its history, with the Hausas, Egyptians and Songrhay as its earliest known inhabitants; describes the advent of the Touaregs, Berbers of Algeria, driven into the desert by the Arab invasion of North Africa, slowly accommodating themselves to desert conditions, occupying many oases, spreading to the southern edge of the desert and making one of their strongholds in Air; epitomizes their history there till the French occupation; depicts with considerable detail, the geography, climate, resources and commerce of the country; tells of the political organization, the population groups and tribes, their life and customs from childhood to old age, their fanatical devotion to Islam, the degree of school instruction given by the marabouts, the Touareg industries, costume, alimentation, hygiene, maladies; their tribal dissensions, predatory expeditions and manner of warfare.

Part 3 (44 pp.) tells the story of the French occupation of the oasis and Part 4 (35 pp.) gives the author's views as to the predominant *rôle* that Air is to play in south Saharan affairs, and predicts that France is to exercise a pacific influence in the Sahara, adapting its peoples for modern conditions, bringing them into touch with the outer world by improving their communications, and blessing them, above

all, by establishing a régime of peace and security and teaching them to make the most of their resources. The author does not claim that this is a purely unselfish programme. France is to benefit largely, also, by turning the Sahara to good account.

**Kulturgeschichtliche Streifzüge. Von Dr. Ernst Schultze. I.** Aus dem Werden und Wachsen der Vereinigten Staaten. 225 pp. Im Gutenberg-Verlag, Hamburg, 1908. M. 2.

The title comprehends a great deal more than is included in the letterpress, which is merely sketchy and, in large part, trivial. Though the author tells us that half of our countrymen are of foreign origin, he includes all of us under the generic term "Yankees." He tells the story of Joshua A. Norton, of San Francisco, "Emperor of the United States and Protector of Mexico," of floating theaters on the Mississippi and of some other things that may beguile an idle hour but are very feebly edifying. The book seems to be adapted chiefly for the class of readers that has no preference for serious mental pabulum. It is a rather surprising volume to come from the pen of Dr. Schultze, who has geographical acumen and has done solid and discriminating work both as a geographical writer and editor.

**Geography, Structural, Physical and Comparative. By J. W. Gregory.** viii and 305 pp., 32 Plates and coloured Maps, 97 Illustrations in the text and Index. Blackie & Son, Ltd., London, 1908. 6s.

Prof. Gregory divides his book into four parts, considering (1) the Structure and Materials of the Earth; (2) Earth Forms and how they are made; (3) The Influence of the Atmosphere and Oceans; (4) Descriptive Geography, which includes considerably more than half of the book. Dr. Gregory has international reputation as an explorer and educator, but his book is not comparable with some of the recent American texts, for the excellent reason that he has not given himself sufficient space to cover adequately, for text book purposes, the wide fields of geographical knowledge he essays to treat. What he does is, on the whole, very well done, but he does not do enough. The treatment is necessarily sketchy, and though there is much that is meritorious in the work, its usefulness would seem to be largely confined to the suggestions which educators, well qualified to teach the subject, may find in its pages for their own amplification in the class room.

**A Sketch of Historical Geography. By Keith Johnson.** With an Appreciation of the Author by Sir Clements Markham. ix and 232 pp., 12 Maps and Index. Edward Stanford, London, 1909. 3s. 6d.

This is a reprint of the historical portion from the sixth edition of the author's well-known "Geography: Physical, Historical, Political and Descriptive." The latest edition appeared last year under the competent editorship of Dr. A. H. Keane. Johnston was known as an accomplished geographer for some years before his early death in African exploration, and his sketch of historical geography, now produced in this separate publication, has been called, on high authority, the best in our language.

**Ortsnamen und Sprachwissenschaft. Ursprache und Begriffsentwicklung. Von Dr. Täuber.** 259 pp, Illustration and Index. Art. Institut Orell Füssli, Zürich, 1908. M. 5.

It is by no means easy to discover just what object is sought to be attained in this work. It follows upon a very respectable series of investigations into the

place names of Switzerland, a very commendable line of research for a people whose livelihood depends so largely upon the coining of alp and glacier for those who visit the summer playground of Europe, to which, of late, a winter season has been added.

But Dr. Täuber does not rest content with this. Adding to his armamentarium the Greek etymology of Curtius, good so far as it goes but by no means recondite, and the by no means satisfactory Trombetti work on the single centre of speech genesis, he marshals his diligently studied place names to establish the arcana of the Aryan speech and to show that these European wanderers were in possession of a high degree of culture. The latter point, of course, finds elsewhere more satisfactory proof. He can scarcely contend that his place names can find an earlier establishment than the physical remains of the past which have been so abundantly brought to light and which have so sedulously been studied by archæologists. A spear head or a fibula of the bronze age proves this more definitely than any amount of philological disquisition.

We have long been aware that the earliest linguistic records of our Aryan tongues end in the irreducible. From our modern languages of analytic type we may pass readily to their inflectional precursors. Having a sufficient mass of material in the classic inflected languages of Greece and Rome, of Persia and of Sanskrit India, we may toil laboriously to an Aryan parent speech. We find it inflected, only dimly do we recognize that the parent speech is pointing its transition from an earlier type of agglutination. Even had we established the agglutination of the Aryan parent, we should be yet indefinitely remote from the proof of our author's assumptions. It is only in the isolating speech that we may really feel that we have reached a speech genesis and the disclosure of its primal arcana and of the coefficient value of the several consonantal modulants, as in long ages of development they come within the use of the human voice organs.

Satisfactorily to himself, our author finds the most primitive roots of speech, not merely Aryan but universal speech, in the eight which follows: RA, water; LA, meadow, water; MA, food, drink, wet meadow; KA, cattle; SA, pasture (MA, KA, SA passing into stone); PA food, shelter; TAR, wood; NA, atmospheric fluid. A most monstrous wet time primitive man seems to have had.

In passing we note his derivation of "hailstone" and "cocoanut" from the same Aryan source; it seems to have escaped our author's notice that the cocoanut derives not from the snows of higher India but from the alluvium of the Nile valley and that the Greeks borrowed the Egyptian stem ***kuku***. Similarly his discussion of *porta* and *portus* will scarcely win support for his conclusion that they are homogenetic and that the original signification is to carry from sea to shore.

Passing over many such instances which will readily suggest themselves to all who have made any study of Aryan word origins, we note our author's essay into the wider field of universal speech (he appears to think there is such a thing), because it involves some matters less familiar to students of our own tongues.

Taking for text his identification of TAR with wood, he notes the correspondence of the name Tarawera "a New Zealand lake surrounded by beautiful mountain and forest scenery," of Toltec as the name which the advancing Aztecs gave to their predecessors as "a sort of bushmen," of Toronto as "an Indian name signifying tree-in-water."

These would be highly instructive, but there are obstacles.

Tarawera is a lake in New Zealand, but it derives its name from the mountain in a hollow of whose flanks it has collected. Tarawera is one of the volcanic

peaks whose activity some five and twenty years ago destroyed the terraces of the Rotomahana. It is properly translated as "hot peak," and the heat of its *wera* component would prove quite sufficient to carbonize any trace of TAR wood in the former member. The Toltecs were living under conditions of a high urban culture when the Aztecan marauders descended upon them, therefore in no sense susceptible of description as bushmen or forest dwellers. And as for Toronto, its signification in Algonkian is plain, it means a place of meeting.

Of such sort is the philology set before the Alpinists. W. C.

**The New Flora of the Volcanic Island of Krakatau. By Dr. A. Ernst. Translated from the German by A. C. Seward.** iv and 74 pp., 2 sketch Maps and 12 Illustrations from Photographs. Cambridge University Press and G. P. Putnam's Sons, New York, 1909.

Prof. Ernst's paper in German, of which this book is the English translation, was reviewed in the *Bulletin*, Vol. 40, p. 685, 1908. It shows the enormous progress in the reclothing of what remains of the volcano with vegetation, the mountain having been entirely denuded of plant growths in the famous eruptions and explosion that blew half of the island into the air. The translation of this able pamphlet is entirely justified by the fact that Prof. Ernst describes a unique example of the plant colonization of an island that had been deprived of vegetation by a series of volcanic eruptions.

**Theodore Roosevelt, Dynamic Geographer. By Frank Buffington Vrooman.** 105 pp. Henry Frowde, Oxford University Press, London, and New York, 1909.

The book is based on a lecture delivered to the School of Geography, at Oxford University, in March last. The author defines the dynamic geographer as one who helps to make geography, as, for example, by making two blades of grass grow where one grew before. Some of Mr. Roosevelt's policies, while he was President, were intimately connected with the national resources, either in their production or transportation; and, in the author's opinion, he deserves the highest rank among constructive, economic geographers for the new ideas he promoted as to national conservation of resources and for laying scientific foundations for a greater people in the future. The author speaks, at length, of the President's powerful influence in revivifying the Panama Canal project, his promotion of the idea of greatly increasing the usefulness of the Mississippi River and its tributaries, his enthusiastic advocacy of the reclamation of desert lands and of Government forest reserves and the application to them of forestry methods, his enhancement of the usefulness of the work of the Agricultural Department, his White House Conference of governors for the better organization of conservation policies, one of whose striking results has been the organization in 36 States of conservation committees. Mr. Vrooman gives a striking survey of the work that many of the Federal and State bureaus are now doing for the development and conservation of our natural resources.

**Die Völker Südosteuropas und ihre politischen Probleme. Von Paul Dehn.** iii and 98 pp. and Map. (Angewandte Geographie, III. Serie, 8 Heft.) Gebauer-Schwetschke Druckerei und Verlag, Halle a. S., 1909. M. 2.50.

A study of the complex of peoples in the Balkan Peninsula and Austria-Hungary, as relates especially to their economic and national life. The author is

both an economic geographer and a publicist, and he treats his subject both from the geographical and the political points of view. His work is very informing. There are no elaborate discussions, for, in this excellent series of books on Applied Geography, space is limited. The author is therefore confined to a terse presentation of facts, of their bearing upon the public and private life of these peoples and of the interests of exterior powers that are involved in Balkan conditions and complications. He describes each of the Slav and non-Slav races as to its numbers, distribution and cultural and industrial conditions. The second half of the book is devoted to a definition and brief discussion of the Servian and Bulgarian questions and of Turkey under its new régime. The work concludes with a short chapter on the attitude of the Powers towards these countries and another on certain tendencies of the time which seem to justify some prognostications as to the future of southeastern Europe. It is doubtful if any other book in so small a compass gives an equally illuminating view of such aspects of that part of the world.

**The Social Life of Flatbush and Manners and Customs of the Dutch Settlers in Kings County. By Gertrude Lefferts Vanderbilt.** 291 pp., Illustrations and Appendix. Frederick Loeser & Co., Brooklyn, 1909. $1.50.

The book was written about thirty years ago and this is a new edition. The volume is worth perpetuation for the light it throws on the settlement and development of the ancient town of Flatbush and the ways of life of its founders. The Rev. T. M. Strong published a history of Flatbush nearly sixty years ago, but the author of the present work treated the subject from a different standpoint. As a woman, she naturally inclined to the social side of life, and she pictured the early days from that point of view and adds details of the changes that time made among the people in their homes. A great deal that she describes was not peculiar to that locality and applied to the early Dutch settlers, far and wide, and to those who came after them.

So she tells of the exterior and interior of the Dutch homes, the furniture, cooking utensils, silver and china, musical instruments and pictures, dress, weddings and funerals with many quaint quotations giving zest to the narrative. We learn from the bill of the funeral expenses of a certain well-to-do and respected citizen, after the English had partly supplanted the Dutch, that "20 gallons good wine, 2 gallons spirits, ½ gros long pipes, 4 lbs. tobacco and 1½ dozen black silk handkerchiefs" were among the important items. Flatbush was long separated from "Breuckelen" by some miles of farm lands and virtue and good order prevailed there. There was no record of murder or homicide in the town for a period of 150 years. A due share of space is given to the farms and farm methods, domestic service and other phases of the early times. Mrs. Vanderbilt wrote from a full heart and with an intelligence well stored with the interesting history she recorded.

**Yunnan, the Link between India and the Yangtze. By Major H. R. Davies.** xii and 431 pp., Map, 73 Illustrations, 9 Appendixes and Index. Cambridge University Press and George Putnam's Sons, New York, 1909. $5.

The Chinese Province of Yunnan, long almost inaccessible, is just being revealed to the Occident in geographical literature. There are still many blank places on its map and a wide field of research remains for specialists in all

branches of natural science. It is gratifying to have so timely and ably written a book on Yunnan. A considerable part of it is a revelation of the unknown, for the author travelled over 5,500 miles in the country and more than half of the regions he visited had never been explored by white men. The book will be indispensable to geographers who specialize in eastern Asia and to any person interested in the development of this rich part of China.

It is a record of four journeys which Major Davies made in Yunnan between 1894 and 1900. Their purpose was to ascertain the feasibility of constructing a railroad between India and the Yangtse River. The studies for the suggested railroad were so extended that the author was able to lay out a route for the consideration of the British Government. He makes it perfectly clear that the engineering difficulties in this land of mountains will be formidable and that the prospects of financial success, in the near future, are doubtful. In the first three chapters, he discusses the project, and in one of the appendixes gives a more detailed description of the proposed line and of the nature and products of the region through which it would pass.

The great interest of the volume, to the general reader, is the author's account of his travels in Yunnan and the neighbouring provinces. His narrative includes a large amount of information concerning the various tribes of western China, some of whom are so shut out from the rest of the world that their headmen were doubtful as to the necessity of respecting even a passport from the imperial authorities at Pekin; and the country ahead was occasionally thrown into a state of excitement by rumours that an invading army was approaching.

The nine appendixes enlarge upon the commercial, industrial and ethnical aspects of the Province; and the numerous photographs and fine map add much to the interest and value of this exceptional work.

**Die Küstenseen des Rigaer Meerbusens. By F. Ludwig.** (Arbeiten des Naturforschervereins in Riga. New Fol., II.) 197 pp., 3 Tables and 23 Plates and Map. W. F. Häcker, Riga, 1908.

Twenty-six lakes are considered, chiefly as to the chemical constitutents of their waters and mud, their plankton, colour, transparency, temperature and depth of the mud bed which, in places, is as much as 16 feet thick. The coloured plates show contours of depth and profiles and a map, 1:200,000, illustrates the position of the lakes.

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BRIEF MENTION.

The Stereograph and Stereoscope. With Special Maps and Books forming a Travel System. By Albert E. Osborne. x and 288 pp., Drawings and Index. Underwood & Underwood, New York, 1909. $1. The author describes various kinds of pictures and explains, with the aid of diagrams, the stereograph and stereoscope, reaching the conclusion that they are preeminently adapted to give the same sense of solidity, depth and space that we feel when looking at an actual scene. Among the helps in using stereographs are maps showing the actual area revealed by the picture. With such helps, the pictures and the stereoscope in which they are shown may be made, in their educational results, an effective, if not wholly adequate substitute for travel.

Islandica. An Annual relating to Iceland and the Fiske Icelandic Collection in Cornell University Library. Edited by George William Harris, Librarian. Vol. II. The Northmen in America. By Halldór Hermannsson. v and 92 pp. Cornell University Library, Ithaca, 1909. Contains principally a list of writings commenting upon the accounts given in the Sagas, of the voyages to America and the settlements made there by the ancient Norwegians and Icelanders.

Turtle Shell Rattles and other Implements from Indian Graves at Athens, Pa. By Christopher Wren. Reprint from *Proceeedings and Collections* of the Wyoming Hist. and Geol. Soc., Vol. 10, Wilkes-Barre, Pa. 18 pp. Ills. Dr. Wren describes the finds and discusses their uses.

Deutschlands Stellung in der Weltwirtschaft. Von Prof. Dr. Paul Arndt. iii and 129 pp. B. G. Teubner, Leipzig, 1908. M. 1. Discusses Germany's production, commerce, communications, immigration, emigration, colonies, etc., and the natural and historical foundations of Germany's place in the trade and industry of the world.

Eduard Glaser's Forschungsreisen in Südarabien. Von Dr. Otto Weber. 32 pp. and Portrait. J. C. Hinrichs, Leipzig, 1909. Reprint from *Der Alte Orient,* Vol. 10, No. 2. A résumé of the four great journeys of Dr. Glaser in Arabia. He died in 1908, leaving many contributions to science, including the tracing of the origin of the Abyssinian kingdom to its home in Arabia.

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## CURRENT GEOGRAPHICAL PAPERS.

### NORTH AMERICA.

CANADA. ALBERTA. ECONOMIC GEOLOGY.—Coal in Alberta. J.-A. Paulhus. *Bull. Soc. Géog.* de Québec, No. 4, 1909.

CANADA. GEOGRAPHICAL NOMENCLATURE.—Geographic Board of Canada. Decisions May, 1909. *Extract* from *The Canada Gazette,* May 29, 1909.

CANADA. GEOLOGICAL SURVEYS.—Explorations in the Churchill River and South Indian Lake. W. McInnes. *Sessional Paper* No. 26, *Summary Report* Geol. Sur. Branch Dep. of Mines for 1908. Ottawa, 1909.

CANADA. GEOLOGICAL SURVEYS.—A Geological Reconnaissance along the National Trans-Continental Railway from the St. Lawrence River to the Interprovincial Boundary between Quebec and New Brunswick. *Sessional Paper* 26, *Summary Report,* Geol. Sur. Branch Dep. of Mines for 1908. Ottawa, 1908.

CANADA. LIMNOLOGY.—A recently explored Lake in the Rocky Range of Canada. Indian's Map and Ills. Mary T. S. Schäffer. *Bull. Geog. Soc. Phil.,* No. 3, July, 1909.

MEXICO. AGAVES.—The Mexican Fiber Agave known as Zapupe. W. Trelease. *Trans. Acad. Sci. St. Louis,* No. 3, 1909.

MEXICO. STATISTICS.—*Boletin de Estádistica Fiscal.* For 1908. No. 333, Dec., 1909.

NORTH AMERICA. PALEONTOLOGY.—Correlation of the Middle and Upper Devonian and the Mississippian Faunas of North America. Stuart Weller. *Journ. of Geol.*, No. 3, 1909.

NORTH AMERICA-EUROPE.—North America and Europe: a Geographical Comparison. Prof. A. Penck. *Scott. Geog. Mag.*, No. 7, 1909.

UNITED STATES. COTTON.—Cotton Production 1908. *Bull.* 100, Bureau of the Census, 1909.

UNITED STATES. ECONOMIC GEOLOGY.—Investigations Relating to Iron and Manganese by the United States Geological Survey in 1908. *Bull.* 380-E, 1909.

UNITED STATES. ECONOMIC GEOLOGY. MICA.—The Production of Mica in 1908. D. B. Sterrett. Chapter from *Min. Resources Calendar* for 1908. U. S. Geol. Sur., 1909.

UNITED STATES. GEOGRAPHICAL NOMENCLATURE.—Decisions of U. S. Geographic Board, June 2, 1909.

UNITED STATES. PATHOLOGY.—Tuberculosis among certain Indian tribes of the United States. Ills. A. Hrdlicka. [A detailed account of Dr. Hrdlicka's investigations into the conditions with regard to tuberculosis of the Menominee, Ovala Sioux, Quinaielt, Hupa and Mohave Indians.] *Bull.* 42, Bureau Amer. Ethnol. Smithsonian Inst., 1909.

UNITED STATES. STATISTICS.—Statistical Abstract of the United States. 1908. Dep. of Commerce and Labor, 1909.

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UNITED STATES. ILLINOIS. ECONOMIC GEOLOGY.—The Mineral Production of Illinois in 1908. R. S. Blatchley. *Circular* No. 5, State Geol. Sur. Urbana, 1909.

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# NEW MAPS.

## AFRICA.

AFRICA.—Bathy-Orographical Map of Africa. Scale, 1:8,400,000=132.4 miles to an inch. W. & A. K. Johnston, Ltd., Edinburgh and London, 1909 (?). Coloured for elevations and sea depths, rivers and geographical names in black and all so clearly expressed as to adapt the map for use in large class rooms.

DAHOMEY.—Carte du Dahomey. Scale, 1:500,000=7.8 miles to an inch. Dressée par A. Meunier. 3 Sheets. Ministère des Colonies, Paris, 1908. A list of the administrative officers and others who made the surveys and route traverses, upon which the map is based, is given. The south sheet is nearly covered with the work of these surveyors and travellers and the result is a good, detailed map of lower Dahomey; but there are many large white spaces on the two sheets of upper Dahomey, and much of the topography is based on approximate sketches. The map shows the results of the study of the colony up to this time.

FRENCH CONGO.—Carte du Congo Française. Scale, 1:5,000,000=78.9 miles to an inch. Dressée par Emmanuel Barralier. Service Géographique des Colonies, Paris, 1906. The map was prepared to show the new administrative subdivisions of the French Congo as fixed by the decree of Feb. 11, 1906. A good map of the colony on a small scale.

FRENCH WEST AFRICA.—Carte de l'Afrique Occidentale Française. Scale, 1:2,000,000=31.56 miles to an inch. Par A. Meunier et E. Barralier. Second Edition, 1908. 6 sheets. Ministère des Colonies. Service Géographique et des Missions, Paris, 1903 and 1908. First produced in 1903, this map of the vast possessions of France in West Africa is one of much utility. It covers West Africa from 20° N. Lat. to the Gulf of Guinea and from the Atlantic to Lake Chad. The first edition gave a large amount and variety of information to which much is being added in the sheets of the second issue which began to appear

last year. All the telegraphs and steamship routes along the coasts are laid down and in the many hundreds of inland routes, shown in red, distinction is made between those followed by explorers and those mapped merely on report.

FRENCH WEST AFRICA.—Carte de la Guinée Française. Scale, 1:500,000=7.8 miles to an inch. Dressée par A. Meunier. 4 sheets. Ministère des Colonies. Service Géographique et des Missions, Paris, 1902 and 1909. The first edition of this map appeared in 1902, but in the map here noticed the sheets Konakry and Kouroussa have been revised in the present year. The revision of the two remaining sheets will probably soon appear. The map has been compiled from the surveys and traverses of 45 surveyors and explorers and the French and English hydrographic charts. The great variety of information given is explained in the legend. The map is printed in 4 colours, red for boundaries, brown for topography, blue for hydrography and black for names and routes.

FRENCH SOMALI COAST.—Carte de la Côte française des Somalis. Scale, 1:500,000=7.89 miles to an inch. 3 sheets. Sheet 1 (Djibouti). Service Géographiques des Colonies, Paris, 1908. The map is especially timely in view of the inadequacy of all earlier maps of this region. Elevations are shown by brown sketching and figures (in meters), hydrography in blue, boundaries in red, and names, railroad and caravan routes in black. Wells, cable lines and contours of depths in coastal waters are given.

IVORY COAST.—Carte de la Côte d'Ivoire. Scale, 1:500,000=7.89 miles to an inch. Dressée par A. Meunier. Sheets 3, 4, 5 and 6. Ministère des Colonies. Service Géographique et des Missions, Paris, 1905. Sheets 1 and 2 of this map have not yet been published. Few maps on so large a scale have yet been produced of any considerable area in tropical Africa. The map, printed in 5 colours, shows the extent of the forests, hundreds of routes and itineraries, thousands of place names, symbols indicating the nature or importance of population centers, customs houses, trading posts, telegraphs, railroads, waterfalls, rapids and other obstructions to navigation. Contours show depths along the coasts. The map is based upon the itineraries and studies of 45 explorers, whose names are given, and upon British survey sheets of parts of the same region.

## ASIA AND EAST INDIES ARCHIPELAGO.

ASIA.—Bathy-Orographical Map of Asia. Scale, 1:9,300,000=147 miles to an inch. W. & A. K. Johnston Ltd., Edinburgh and London. A superior school wall map. 6 shades of brown for elevations from 1,000 to 20,000 feet and over, 2 of green for lowlands, a distinctive tint for lands below sea level, and 6 tints of blue for sea depths. Many mountain heights are also given in feet. The rivers and geographical names are very clearly expressed in black and the map is well adapted for use in a large class room. For the most part the latest data are used, but the map does not agree with the most recent determinations of the India Survey Department, which give Kinchinjunga instead of Austen Godwin the second place among the highest mountains of the world; nor is the deep trough shown that was discovered by the *Planet* expedition in 1907, just a little east of the Philippines and mapped in *Annalen der Hydrographie* (No. 5, 1907).

EAST INDIES ARCHIPELAGO.—Overzichtskaart van den Oost-Indischen Archipel. Scale, 1:2,500,000=39.4 miles to an inch. 6 sheets. 14° N.-12° S. Lat.; 94°-144° E. Long. Topographical Survey of the Dutch East Indies, Batavia, 1908. Price, 8.50 guilders and postage. A list (61 pp.) of the geographical names on the

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map, accompanies the sheets. This is the best general map of the entire East Indies Archipelago that has yet appeared. The sheets are intended for mounting as a wall map. All rail and many other roads, ports, lighthouses, anchorages, depths in fathoms and heights in meters, ocean cable lines, etc., are shown. The waters are in blue and the mountains in brown wash. The scale is large enough to permit the insertion of all place names without crowding or obscurity. The spelling of some place names does not conform with accepted usage and may well be corrected in a later edition.

## AUSTRALASIA AND OCEANIA.

AUSTRALIA.—Vegetationskarte von Australien. Scale, 1:27,000,000=436.1 miles to an inch. Illustrates "Die Vegetation der Erde" VII. Die Pflanzenwelt von West-Australien. By Dr. L. Diels. Wilhelm Engelmann, Leipzig, 1906. 7 tints and white used to show botanical distribution.

AUSTRALIA AND TASMANIA.—Mean Annual Rainfall Map, Australia and Tasmania. No scale. Published under the direction of H. A. Hunt, Commonwealth Meteorologist, in *Bull.* 2, Commonwealth Bureau of Meteorology, Melbourne, 1908. The mean annual rainfall is shown by isohyetal lines for every ten inches of rainfall, continuous lines being used for complete, and broken lines for incomplete data. The accompanying text discusses the rainfall and describes from whence and by what agencies the rains are precipitated in different parts of the Continent. The rainfall areas are thus given: 0 to 10 inches per year, 938,007 square miles; 10 to 20 inches, 1,080,048; 20 to 30 inches, 515,003; 30 to 40 inches, 264,178; over 40 inches, 177,345.

TASMANIA.—Tasmania. Geological Features. Scale, 15 miles to an inch. Illustrates "A Naturalist in Tasmania," by Geoffrey Smith. Clarendon Press, Oxford, 1909. From a map issued by the Lands and Surveys Department of Tasmania. The geology is shown in 9 tints and black symbols give the distribution of metals and economic minerals.

NEW ZEALAND.—(a) Topographical Maps of the following Survey Districts: Toaroha, Waitaha, Mount Bonar and parts of Wanganui and Poerua, Totara, Whitcombe Pass and Portions of Poerua and Butler. (b) Geological Maps of the above Survey Districts. Scale, 1:63,360=1 mile to an inch. Illustrate *Bull.* 6 (New Series) "The Geology of the Mikonui Subdivision, North Westland," by Percy Gates Morgan. New Zealand Geological Survey, J. M. Bell, Director, Wellington, 1909.

NEW GUINEA.—Reiseroute im Westl. Finisterre Gebirge. E. Werner. (*a*) Umgebung von Cap Rigny. Scale, 1:160,000=2.5 miles to an inch; (*b*) Skizze des Gelu-Gebietes. Scale, about 1:160,000; (*c*) Panorama des Finisterre-Gebirges von Damun-aus; (*d*) Profile of Hansa Vulkan. *Pet. Mitt.*, Vol. 55, No. 4, Justus Perthes, Gotha, 1909. Illustrates a paper, "Im westlichen Finistergebirge und an der Nordküste von Deutsch-Neuguinea," by Dr. Werner.

## EUROPE.

FRANCE.—Carte des Gisements de Coquilles comestibles de la partie des Côtes du Nord comprise entre La Pointe de Minar et le Cap Fréhel. Scale *ca.* 1:53,000=0.83 miles to an inch. Dressée par L. Joubin. Illustrates *Bull.* 141, *de l'Institut Oceanographique,* Monaco, 1909. Shows the state of these fishing grounds in Nov., 1908.

GERMANY.—Die Ketscher-Seengruppe bei Posen. Scale, 1:25,000=0.3 mile to an inch. By Hermann Schütze. *Pet. Mitt.*, Vol. 55, No. 5, Justus Perthes, Gotha, 1909. Coloured contours of land heights and lake bottoms. Illustrates "Die Ketscher Seengruppe bei Posen," by Dr. Schütze.

ITALY.—Verbreitung der Fruchthaine in Italien. Scale, 1:5,000,000=78.9 miles to an inch. Von Otto Brill. *Pet. Mitt.*, Vol. 55, No. 5, Justus Perthes, Gotha, 1909. Showing in colours the distribution of the olive, chestnut, almond and mulberry trees and citrus fruits in Italy, Sicily, Sardinia, and Corsica. Illustrates a paper, "Die Fruchthaine in Italien," by O. Brill.

## POLAR.

ANTARCTIC.—Luftdruck-Mittelkarten für den Umkreis der Drake-Strasse. By Dr. Ludwig Mecking. *Pet. Mitt.*, Vol. 55, No. 5, Justus Perthes, Gotha, 1909. 3 Charts showing mean atmospheric pressure for the surroundings of Drake Strait (between South America and West Antarctica). The charts are, respectively Annual (October, 1901, to March, 1904); Summer (December, 1902, to February, 1903); Winter (June to August, 1902). Illustrates a paper, "Zum antarktischen Klima," by Dr. Mecking.

## WORLD.

WORLD.—Berghaus's Chart of the World on Mercator's Projection. Entirely reconstructed by Hermann Habenicht and Bruno Domañn. 14th Edition. Justus Perthes, Gotha, 1909. It is gratifying to have an edition in English of this most famous of all general charts of the World. The German editions have been before the public since 1863 and the great variety of accurate information presented, kept up to date in the numerous revisions of the chart, are so well known as to require no recapitulation here. It may be said, in a word, that the chart combines the larger phases of information that concerns the business world, such as the important land steam and caravan routes, the routes actually in use by ocean carriers, treaty ports, colonial possessions, islands where supplies are kept for mariners in distress, etc., with a large amount of physical detail, as the régime of the prevailing sea winds, the direction and rate of movement of ocean currents, magnetic declination, limits of pack and drift ice, etc., which are important not only in commercial activities, but also for the student of physical geography.

## ATLASES.

FINLAND.—Atlas de Statistique sociale sur les Communes rurales de Finlande en 1901. [Explanatory Text in Russian, Finnish and French.] 54 Map Plates in Colours. Geographical Society of Finland, Helsingfors, 1908. A folio, illustrating, cartographically, the conditions and activities of the people of Finland as to their land holdings and the various uses made of them. The work maintains the high standard of the geographical and cartographic productions of that Society. The maps are described in detail by Dr. Hannes Gebhard, compiler of the Atlas, in *Fennia*, Vol. 24.

FRENCH AFRICAN COLONIES.—Atlas des Colonies Françaises. Dressé par ordre du Ministère des Colonies. Par Paul Pelet. 27 Planches de cartes; Texte explicatif; Index alphabétique. Librairie Armand Colin, Paris, 1902. The finest colonial atlas yet produced by any country of its over-sea possessions. The plates,

most of them double sheet maps, are on scales so large that practically all information accessible, up to the time of publication, is clearly expressed. Explorers' routes in red give a cartographic history of the exploration of these newer lands, the dates of these explorations, however, being reserved for the explanatory text. The text supplies a full description of each map, including its historical, cultural and commercial aspects. This atlas supplanted the "Nouvel Atlas des Colonies françaises," published by the French Government in 1891. The present edition needs only revision to bring it up to date and make it incomparably the best source of general cartographic reference for the vast regions included in it.

SWEDEN.—SVERIGES JORDBRUK VID 1,900 TALETS BÖRJAN.—Statistiskt Kartverk. Utarbetadt af Wilhelm Flach, H. Juhlin Dannfelt, Gustav Sundbärg. [Agriculture in Sweden at the opening of the Twentieth Century.] Göteborg, 1909. A folio statistical atlas containing 261 pages of text and 88 large map plates illustrating agriculture in the kingdom. The table of contents is printed both in Swedish and French and there is a Swedish-French vocabulary of words used in the map titles and explanations and the statistical tables. The work is based upon the thorough and systematic statistics collected by the government. In paper, printing, map quality, lithography and in the scientific and orderly discussion of the subject this sumptuous atlas is a work of the first class. Part I considers natural conditions important for agriculture, geology and meteorology in their bearing upon plant growth and development. Part II discusses and maps the distribution of human occupations and social conditions that help or retard agricultural development. Part III, which fills four-fifths of the work, deals with the rural economy of Sweden. For example, ten pages of text and five maps treat of the percentage which each kind of land (plow land, garden, natural prairie, forest and other lands) forms of the whole area of the country. Each crop and each species of farm animal are treated and mapped in their numerical relation to the population and the farm area of Sweden. Thus milch cows are discussed and mapped as to their number per 1,000 inhabitants and per 100 hectares of arable land, and the average production of milk per cow and per inhabitant, the maps showing these conditions throughout the country; thus a graphic picture of the milk industry in all parts of Sweden is given. Most of the maps show six or more tints. The Atlas is worth wide attention for its method as much as for its contents.

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## OTHER ACCESSIONS.

BLAIR, EMMA HELEN, and ROBERTSON, JAMES ALEXANDER.—(Editors). The Philippine Islands 1493-1898, etc. Vols. LIV-LV. Analytical Index to the Series. Cleveland, Arthur H. Clark Co. 8vo. 1909.

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